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TELEPHONY

THE JOURNAL OF THE TELEPHONE INDUSTRY

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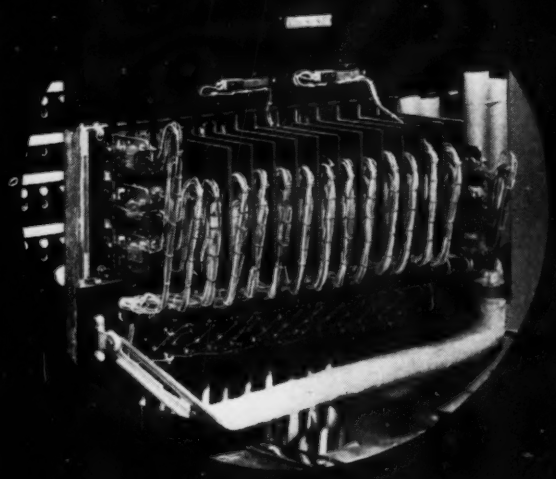
XUM

IN ALL TELEPHONY...
THERE IS NOTHING FINER THAN A

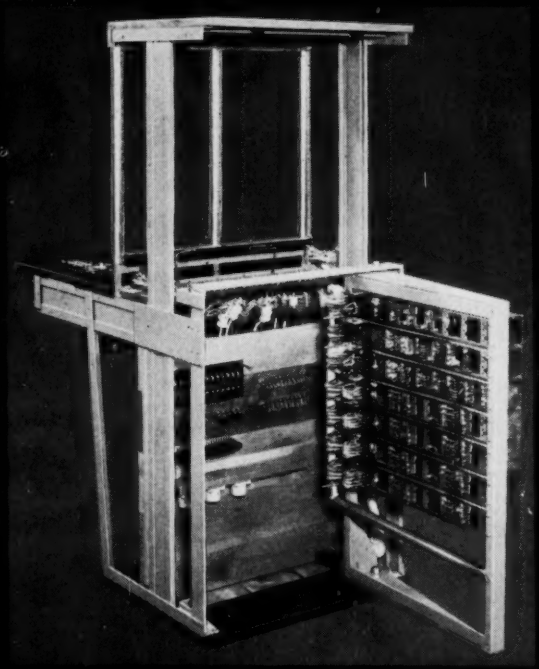
Stromberg–Carlson "No3

It is likely that long-distance operation represents the future problem most worthy of serious consideration today. Some of America's largest independent operating companies have chosen Stromberg-Carlson's No. 3 Toll Switchboard to provide a completely satisfying solution—now, and in years to come. A few of the features which distinguish this ultra-modern equipment are illustrated here. Your nearest Stromberg-Carlson representative will gladly explain more.

Corps of operators shown in this picture are at our Plymouth, Ind., installation. The picture clearly indicates: "This equipment is made for peak traffic!"

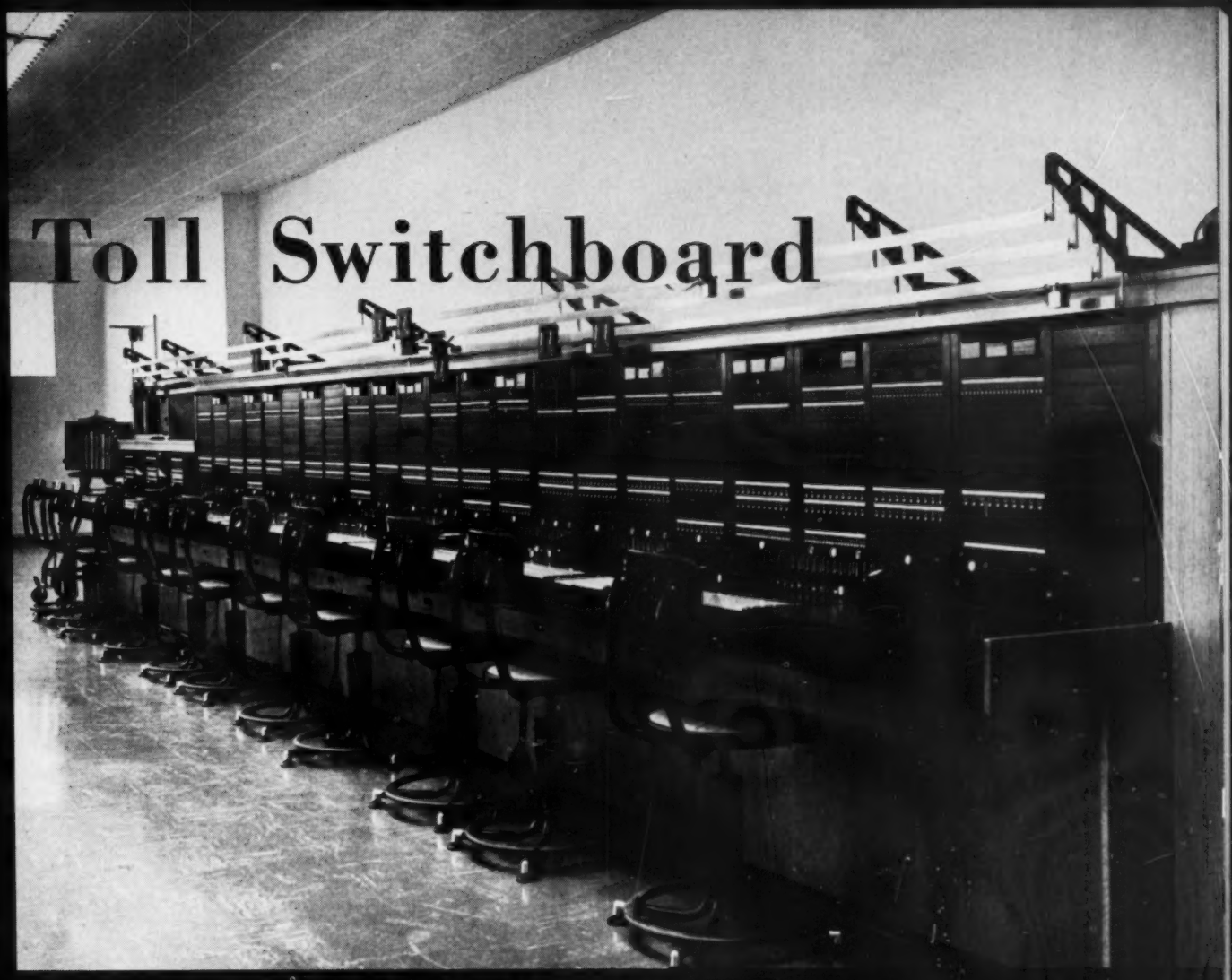


Underside of the Keyshelf—designed for fastest possible maintenance. Note the individual ticket slots for each cord pair.

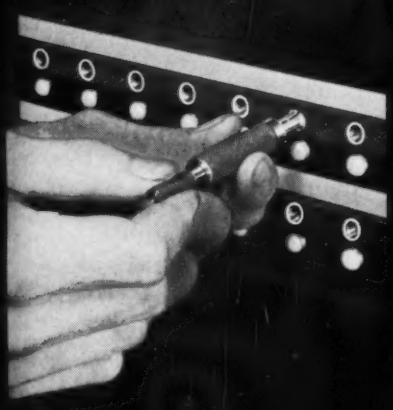


The Relay gate on the Stromberg-Carlson No. 3 Toll Board uses unit circuit plates and swings out for convenience. Both features mean greater, faster accessibility to relays and wiring.

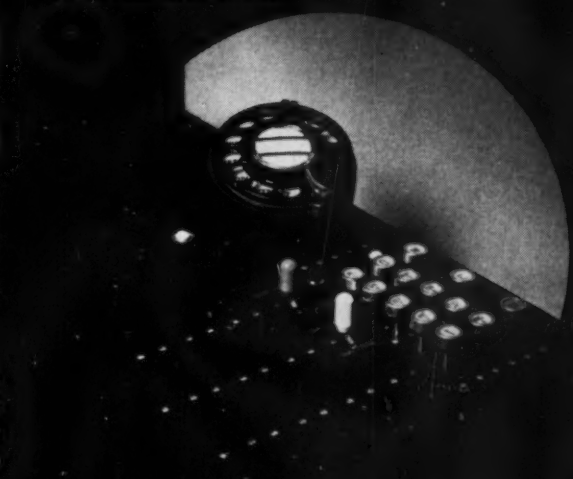
No3" Toll Switchboard



The Carlsbad, New Mexico, installation illustrates, much better than words, the efficiency and compactness of a Toll Exchange system using our No. 3 Type Toll equipment.



Jack Strips feature individually removable Sleeves which are quickly replaceable from the front—while all other lines in the strip remain in service.



The No. 3 Toll Board provides for incorporating, now or later, a standard Keysender—time-saving now, and literally invaluable when Nation-wide Operator Intertoll Dialing is country-wide.

The Service Turret, as compact and convenient as a cordless PBX, may be used either as a Chief Operator's Turret or a Service Operator's Turret.

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XUM

New Year's Resolutions Just About Junked?

Here's One You Can Make Right Now and Keep

The charter of human liberty, our Bill of Rights, was obtained at a high price. A voice in our government, freedom of worship freedom of speech, and all the freedoms of human aspiration did not come into being by accident. They were achieved through struggle, suffering and sacrifice.

Communism is a most sinister and diabolical conspiracy aimed at destroying the Constitution of the United States and substituting therefor a combination of outside force, internal fifth column activities, and a slave state that would dominate and control everyone and every enterprise.

Resolve to: Read the Bill of Rights to yourself *NOW*— then read and explain it to your employees.

KELLOGG
Established 1897

SWITCHBOARD AND SUPPLY COMPANY
6650 SOUTH CICERO AVE., CHICAGO 38, ILLINOIS

Send for your free copy of the Bill of Rights (appearing on opposite page) suitable for framing. This is beautifully reproduced in black and gold on a Waycroft Text cream colored paper stock. Write to Dept. 1-A-2

The Bill of Rights

Amendments 1 to 10 of the Constitution of the United States.

Proposed and approved at the first session of Congress in 1789. Adopted by the required number of State Legislatures under Article V of the Constitution and declared in force Dec. 15, 1791.

ARTICLE I

Congress shall make no law respecting an establishment of religion, or prohibiting the free exercise thereof; or abridging the freedom of speech, or of the press; or the right of the people peaceably to assemble, to petition the government for a redress of grievances.

ARTICLE II

A well-regulated militia, being necessary to the security of a free state, the right of the people to keep and bear arms, shall not be infringed.

ARTICLE III

No soldier shall, in time of peace, be quartered in any house without the consent of the owner, nor in time of war, but in a manner to be prescribed by laws.

ARTICLE IV

The right of the people to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures, shall not be violated, and no warrants shall issue but upon probable cause, supported by oath or affirmation; and particularly describing the place to be searched, and the persons or things to be seized.

ARTICLE V

No person shall be held to answer for a capital, or otherwise infamous crime, unless on a presentment or indictment of a grand jury, except in cases arising in the land or naval forces, or in the militia, when in actual service in time of war or public danger, nor shall any person be subject for the same offence to be twice put in jeopardy of life or limb; nor shall be compelled in any criminal case to be a witness against himself, nor be deprived of life, liberty, or property, without due process of law; nor shall private property be taken for public use without just compensation.

ARTICLE VI

In all criminal prosecutions the accused shall enjoy the right to a speedy and public trial, by an impartial jury of the State and district wherein the crime shall have been committed, which district shall have been previously ascertained by law, and to be informed of the nature and cause of the accusation; to be confronted with the witnesses against him; to have compulsory process for obtaining witnesses in his favor, and to have the assistance of counsel for his defense.

ARTICLE VII

In suits at common law, where the value in controversy shall exceed twenty dollars, the right of trial by jury shall be preserved, and no fact tried by a jury shall be otherwise re-examined in any court of the United States, than according to the rules of the common law:

ARTICLE VIII

Excessive bail shall not be required, nor excessive fines imposed, nor cruel and unusual punishments inflicted.

ARTICLE IX

The enumeration in the Constitution, of certain rights, shall not be construed to deny or disparage others retained by the people.

ARTICLE X

The powers not delegated to the United States by the Constitution, nor prohibited by it to the States, are reserved to the States respectively, or to the people.

COMPLIMENTS OF
KELLOGG SWITCHBOARD AND SUPPLY COMPANY, CHICAGO

FLASHES AND PLUGS

NO LIST FOR THE WICKED. Jokes circulating in Europe today often reflect the political situations prevailing in a particular country. This story was reported from Prague via the New York *Times:*

"Because of a shortage of newsprint, it is widely rumored that the Security Ministry will no longer publish lists of public officials who have been arrested.

"Instead, the names of those who have not been arrested are to be printed. This measure is to conserve paper."

• • •

MAKE MINE RARE. Most people believe that the perfect bridge hand would be 13 spades, which would enable one to make a lay-down grand slam. Actually, according to experts, the perfect bridge hand is stronger than that. It contains in its 13 cards the certainty of seven no trump and includes all four aces, kings and queens, with an odd jack. However, before anyone gets too excited about turning up any such combination, he should be warned that this type of hand is astronomically rare, especially since some mathematical wizard has figured out that a pack of 52 cards can be distributed into 53,644,737,765,488,792,839,237,440,000 combinations, and no two alike.

• • •

REAL ADVENTURE. Col. Gilbert Andrier, French military attache in Ottawa, Ont., did a double take when he read the following advertisement in a help wanted column:

Ten tall men

Wanted for adventure and romance, with the Foreign Legion.

Apply in person . . .

Andrier quickly explained that his government was not conducting a recruiting drive in Canada. A telephone check revealed the ad was a publicity gag thought up by a theater manager who was about to show a picture based on life in the famous legion.

• • •

PERSISTENCE PAYS, SOMETIMES. A housewife, in Zanesville, O., made 12 telephone calls one night in the space of six hours in an attempt to reach her married son who lived several blocks away.

Each time she called the line was busy.

So, in desperation, she finally checked with the operator, who was prompt to investigate.

Little wonder the woman couldn't reach her party. All the while, she was ringing her own number!

• • •

SEND THEM GENERAL DELIVERY. Police in Miami Beach, Fla., were hoping that one George Norman would drop by soon to pick up the clothes he left at city jail.

Norman, wanted in Augusta, Ga., for grand larceny, over-powered the jailer two weeks ago and escaped, taking the jailer's glasses with him. Norman telephoned his attorney to pick up the clothes. He also mailed the jailer's glasses back from Clemson, S. C.

Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY

January 5, 1952

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VERY MUCH ALIVE!

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RECTICHARGER*

EARN THESE BIG REWARDS

A NEW RECTICHARGER® (FOR YOUR COMPANY)

A $100 DEFENSE BOND (FOR YOU)

To demonstrate the remarkable service life and trouble-free performance of the Raytheon RectiChargeR, we want to find — the *oldest* RectiChargeR now in service. To make this search interesting and worthwhile to you and your company, we offer the following rewards:

1. **To the telephone company** owning and operating the Raytheon RectiChargeR with the *lowest serial number* reported, we will furnish in exchange a brand new RectiChargeR of the same capacity.
2. **To the individual** (plant maintenance chief or other responsible official) reporting the lowest serial number for his company, we will award a one hundred dollar United States Defense Bond.

Put yourself and your company in line to earn these handsome rewards. Check the name plates of all your Raytheon RectiChargeRs today. Enter the *lowest serial number* you find. Use the coupon below and be sure to give the name of your regular supplier. Do it today. No entry will be accepted postmarked later than March 31, 1952.

—HERE'S OUR OLD-TIMER—

RAYTHEON MANUFACTURING COMPANY
Waltham 54, Massachusetts

Please enter our oldest RectiChargeR in your "Lowest Serial Number Search".

Serial Number.....

My Name.....

Title.....

Company.....

Address.....

Our Supplier Is.....

Address.....

T

Choose from 78
Trucks and

You are invited to request the FWD "CODE BOOK" which makes it easy for you to select the motorized unit best suited to your work.

Also, upon request, you will be shown a 20-minute movie, demonstrating FWD performance in utility line construction and maintenance. Ask FWD or your nearby FWD distributor.

THE FOUR WHEEL DRIVE AUTO CO.
Clintonville, Wis. • *Canadian Factory:* Kitchener, Ont.
World Wide Sales and Service

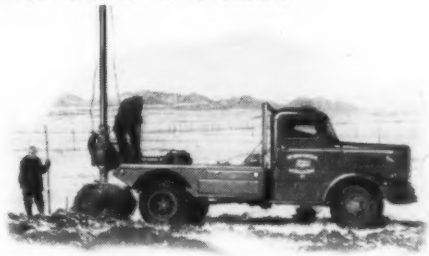
You buy more than a truck when you buy an FWD

Extra traction and *proper distribution* of weight and power give you all this:

- Ability to *follow the job* safely, on or off the highway.
- Ability to restore service faster — meet construction schedules — regardless of weather.
- Lower maintenance cost.
- Up to twice the truck life.

Combinations of Equipment . . .

FWD is the CENTRAL SOURCE for complete mobile workshops . . . including cabs, winches, derricks, boring machines, platform and line bodies



FOR LINE MAINTENANCE

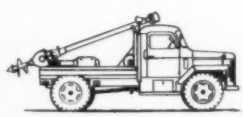
. . . FWD gives you the extra ability to *restore service faster!* Bad weather doesn't slow up FWDs. They *safely* carry men and equipment right to the trouble spot! They are the *economical* answer in all types of *routine* and *emergency* services.

FOR LINE CONSTRUCTION

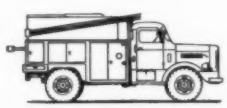
. . . with FWDs you're able to stick to your schedule and meet deadlines. FWDs travel *where* and *when* other trucks can't operate! You can do more work per day — and at lower cost — because FWDS conserve valuable manpower!

WHAT ARE YOUR TRUCK PROBLEMS?

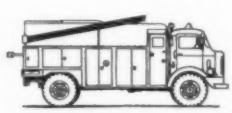
FWD matched combinations answer needs such as these:



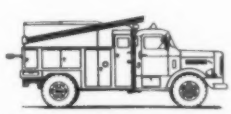
FOR CONSTRUCTION — Consists of earth boring machine with integral derrick, winch and platform body . . . on light duty, medium duty or heavy duty FWDs.



FOR MAINTENANCE — Conventional 3 man cab with line maintenance body, winch, derrick. Combines with light duty, medium duty or heavy duty FWDs.

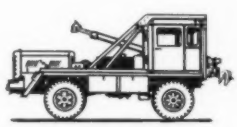


FOR MAINTENANCE—2 man cab over engine style with crew compartment in maintenance body. Winch and derrick. Matched with medium duty FWD chassis.

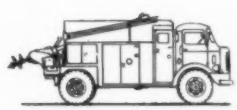


FOR MAINTENANCE — Conventional 3 man cab with crew compartment in maintenance body. Winch and derrick. For light duty, medium and heavy duty FWDs.

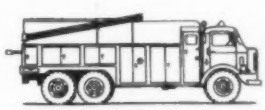
GENERAL PURPOSE TRANSPORT — H 6 x 6 with 5th wheel for use with lo-boy, semi-trailer, full 4 wheel or pole trailer. Winch mounts behind 3 man cab. Tool compartment under platform.



FOR CONSTRUCTION (and maintenance of energized lines) — For one-man operation. Patented. Front mounted earth boring machine with integral telescopic derrick — rear mounted engine — winch. For heavy duty FWD.



ALL PURPOSE LINE MAINTENANCE AND CONSTRUCTION—2 man cab-over-engine. Crew compartment in combination platform and line body. Includes earth boring machine, derrick, winch. For medium duty FWD.



FOR MAINTENANCE — Heavy Duty 6 x 6 has conventional 3 man cab. Crew compartment built into maintenance body. Matched combination includes winch and derrick.

XUM

...Telling the Telephone story with words and music...

Millions of people have come to look on The Telephone Hour as a familiar and welcome visitor in their homes every Monday night. And on this famous radio program, they hear warm and friendly messages explaining various aspects of the telephone business . . . how the telephone industry operates . . . what telephone service means to the public and the nation. . . . On the opposite page is one of the stories that was told on a recent program. Like all Telephone Hour messages for the past 12 years, this was designed to create better understanding between the telephone industry and the people it serves.

BELL TELEPHONE SYSTEM

TELEPHONE HOUR October 8, 1951

BANGHART

There's a real veteran of the Bell System here with us tonight --a veteran with more than 54 years of service. Old fashioned in appearance--a little battered and worn--this veteran is still able to give service after being on duty, day and night, for 54 years!

It's a telephone instrument, one of those old goose-necked, wall-type telephones that haven't been made for more than 30 years. This veteran was installed back in 1897 for Dr. Charles E. Birch, a physician in White Plains, New York.

A few months ago, Dr. Birch, 88 years old, retired from practice and the faithful old telephone retired with him. Many times over the years the telephone company offered Dr. Birch a more modern instrument, but he preferred to keep the old, friendly telephone on the wall.

Just think of the messages that have been carried by this one telephone . . . the calls for help . . . the anxious questions . . . the reassuring words of hope and comfort. Think of how important this one telephone has been in the lives of so many people . . . and how important it was that it be sturdy and dependable in every emergency.

Sturdy and dependable. That's the way the Bell System has built the telephone service that is so important to you and your country today. Yes, a steady and dependable telephone system is essential to the welfare of America. That means that the telephone industry must be financially sturdy and dependable, too. Its financial strength is based upon rates high enough to meet the higher operating costs of today and to attract the investors whose money will be needed to build the telephone service you will want tomorrow.

W. J. O Connor, Manager, New York Telephone Company, White Plains, N. Y.; Donald Voorhees, conductor of the Bell Telephone Orchestra; Ferruccio Tagliavini, tenor; Ken Banghart, Telephone Hour announcer; and Wirth Judge, reporter on the White Plains Reporter Dispatch, examine the actual telephone referred to in the commercial.

XUM

"For the Record"

PENTA* has a superior performance record of 15 years of protecting wood from termites and rot.

PENTA is an approved wood preservative and is a standard of the American Wood Preservers Association.

PENTAchlorophenol is a chemical of constant, uniform effectiveness.

PENTA is clean . . . will not leach.

**PENTA is a popular abbreviation of the name of the chemical, PENTAchlorophenol.*

THE DOW CHEMICAL COMPANY
MIDLAND, MICHIGAN

Write *for Dow's free booklet, "Pointers on Penta."*

The Dow Chemical Company
Dept. PE-19A
Midland, Michigan

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DOW
Penta
chlorophenol

IN THE NATION'S CAPITAL

BY FRANCIS X. WELCH
WASHINGTON EDITOR

FCC rules that company may cut off service used for 'unlawful purpose' but is responsible for action. . . . Finds farm telephone figures confusing. . . . Previews REA co-op movie. . . . Minnesota commission states that existing subscribers don't have to join new co-op.

THE Federal Communications Commission on Dec. 21 ruled that a telephone company may cut off a telephone if it believes it is being used for unlawful purposes, but it must stand responsible for its action (see page 26). The FCC, therefore, ordered American Telephone & Telegraph Co. and Chesapeake & Potomac Telephone Co. to cancel this section of their tariffs by Feb. 1.

"Service will not be furnished if any law enforcement agency, acting within its jurisdiction, advises that such service is being used or will be used in violation of law, or if the telephone company receives other evidence that such service is being or will be so used."

FCC found this provision "unjust, unreasonable, and therefore unlawful" to the extent that the telephone company believed its inclusion absolved the company of liability if it cut off service on the basis of advice from a law enforcement agency. But FCC warned, its decision should not be construed as preventing the telephone company from refusing service, when the company decides such action is justifiable.

In some instances, the commission said, the company may find circumstances are such that service should be discontinued immediately. In other cases, it may be able to give the subscriber time to take legal remedies against discontinuance of service.

The telephone company must use its own judgment in each case and cannot be immunized from civil or criminal liability in the event of a mistaken decision, the FCC ruled. The FCC acted on a complaint filed in 1949 by Harry and Bertha Katz, Washington, D. C. Their telephone was one of 324 which former United States Attorney George Morris Fay sought to have removed in his battle against District gambling. They challenged his right to request the removal and the request was later withdrawn.

Farm Telephone Figures Confusing

This week in TELEPHONY is reported (see page 22) a release by REA, of a state-by-state list of farm telephone comparisons between 1920 and 1950. This list, based on preliminary 1950 census statistics, showed that, although there were nearly 400,000 fewer farms with telephones in 1950 than in 1920, the percentage of farm telephones rose in 28 states and dropped in 20 states.

But the real puzzler is the apparent loss in the actual number of farm telephones in 27 states. This drop, during a period when so much effort has been made to expand and improve farm telephone service (especially within the last few years), already is attracting comment from telephone people throughout the country.

What seems to be happening is that the same telephone, previously serving as a farm telephone, has been shifted into a new classification *which statistically subtracts one farm telephone*, although the same subscriber may still be getting the same service over the same telephone he always had.

A few days ago the farm telephone manager of Michigan Bell Telephone Co., Hans P. Andreasen, registered an explanation of the figures in his state. According to the REA list there were only 83,134 farm telephones in Michigan in 1950 as compared with 97,874 in 1920. But Andreasen said that in 1920 there were 196,447 Michigan farms which made the percentage of farms with telephones 49.8 as of that year. By 1950, *the number of farms had decreased* to 155,575. But 53.5 per cent had telephones during that year, which would indicate a percentage increase in service to Michigan farms despite a drop in the total number of farms.

Refuting the idea that there was any actual loss in telephone subscriptions during the past few years, Andreasen said: "During the postwar period we have gained 85,000 rural telephones, eliminated crank-type operation on 12,000 units, erected 84,000 poles, and strung 46,000 miles of wire."

And from New York state comes the statement of a spokesman for New York Telephone Co. that more than 100,000 telephones have been added to rural areas in the last six years. The total now is 190,000. He said this was 81 telephones for every 100 rural homes in New York.

Telephone lines serving more than eight parties have been eliminated, he said, and the only "turn-the-crank" service left is near Binghamton. He said these 215 telephones would be replaced with modernized equipment within a few weeks.

The 6 million dollar figure for planned new rural construction and improvements in 1952 is about the same as last year's, but much depends on copper shortage and other material supplies during the coming year.

Getting back to national figures, unless REA's estimate of the percentage of farm telephones in 1949 was pretty far off the mark, there would seem to be a loss in farm telephones, even percentage-wise, over a period of one year. It was during the congressional hearings on the proposal to put REA into rural telephone loan operations that REA made an unofficial estimate of 42.2 per cent of farm telephones for 1949, total number of which was placed at 2,473,000. But the recent list, based on the preliminary census figures for 1950, shows only 2,059,474 farm telephones throughout the United States as of Apr. 1, 1950, or 38.3 per cent of all farms.

As this writer pointed out in his analysis of the REA statistics published in TELEPHONY this week (see

XUM

page 22), it is ridiculous to suppose that more than 400,000 farmers took out their telephones during the year between 1949 and 1950. The explanation must lie in such factors as reclassification of farm, as compared with rural service, annexations, subdivisions of rural areas, etc.

Rea Farm Telephone Movie

This writer had the pleasure of attending the "premiere" showing in Washington, D. C., of the REA color movie "The Telephone and the Farmer." This was held on Dec. 19, coincidental with another "premiere" in Forrest City, Iowa, where REA Administrator Wickard participated.

It was near Forrest City that most of the scenes were filmed—most of the actors being nonprofessional. In fact, it was this use of plain everyday farm folks, who re-enacted the steps taken in organizing a typical farm telephone cooperative, which gave the picture a certain unpretentious charm. Professional actors might have been tempted to ham some of the rather melodramatic material to demonstrate how important the telephone can be in an otherwise isolated, snow-bound, rural community.

Although commercial telephone people may look a little askance at the emphasis placed on cooperative organization in this picture, the audience is reminded at the beginning and end of the picture that the first step in getting farm service (or better service, if existing service is inadequate) *is to see the nearest telephone company, if there is one in the area.* The audience is told that often, in this way, farmers are spared the trouble and expense of forming their own cooperative, because the telephone company may be able to work out the solution as a commercial operation.

But the main part of the picture concerns a different setup in the Iowa area, where the lack of service was represented as being a constant source of discomfort, irritation, financial loss, and potential tragedy to the farmers. The situation the movie described—which ultimately resulted in forming the Winnebago cooperative—was a case of a neglected or abandoned service area, which one or more old-fashioned hand-crank farmer mutual systems had failed to keep up.

The story is then developed along the usual corporate promotional line. Farmers get together at a meeting. The REA electric co-op man tells them how it can be done. There are questions and answers and even some slight recognition of dissent. But eventually most agree to form a modern co-op, hire a full-time manager and get an REA loan from Uncle Sam. All this comes to pass and the picture ends on a congratulatory note.

The picture (which will doubtless be shown around to farm groups all over the country) struck this writer as good educational promotion on the need and value of up-to-date rural telephone service. There is even the frank suggestion that farmers are going to have to pay more for it. Finally, it is pretty fair entertainment for about 20 minutes.

An irreverent thought struck this reviewer, however, as he watched the farmers squawk and groan over their service (or lack of it) amid lush fields of thriving crops, fine buildings and silos, farm machinery, and even television aerials—representing original investments of thousands, thousands, and thousands of dollars. Why is it always necessary to ring in Uncle Sam — meaning the general taxpayer—on the solution of so many farmers' financial problems? Would the old farmer telephone mutual systems ever have deteriorated if the farmer's attitude towards laying out a dollar cash of his own money had not sometimes approached the apprehensions of a surgical operation?

When the point is made, in the picture, that these farmers collectively just can't swing the necessary money to improve their own telephone service, one can look at the shiny new automobiles they drive and wonder—"Why not?" The answer seems to be that the American farmer has just about gotten into the habit of having Uncle Sam come to his assistance—crop support, soil conservation, insurance, cheap loans for electricity and telephone service, irrigation and flood control. One can hardly blame the farmer for accepting these benefits. But one may wonder whether other axles on our national economic wagon are being tempted to squeal for some of this federal grease; and if so, where it will all end.

Military Millions

"The Senate preparedness subcommittee has recently put its finger on one of the big reasons for big military expenditures—waste. . . . Lack of cost consciousness on the part of officers in charge of expenditures, says the committee, is a principal cause of waste. This blindness or indifference to the burden being cast on the taxpayer has long been typical of the armed services officials. It's one of the reasons why, with the greatly increased cost for preparedness, a limit may have to be placed on the amount of taxes which can be levied on the people. In some degree, the effect of this would be to force the military and the civilian agencies of government to spend their funds on essentials, not extravagances."—*Anaheim (Cal.) Bulletin.*

You Don't Have to Join

Reference was made in this department last month (TELEPHONY, Dec. 15, p. 13) to the question of whether established subscribers of an existing telephone system have to become duespaying members of a newly formed cooperative taking over the old system. Notice was then given to a reversal of position on the part of one Kansas cooperative (obtaining an REA loan) which first required, and later decided against, levying an annual membership charge against the subscribers of an older system about to be merged.

Reference was also made to a Washington state case in which the state commission served notice that telephone rates and services were questions reserved for the state commission's regulation, regardless of any arrangement made under contract.

Apparently the state commissions are in a position to protect the subscribers of existing telephone companies from being confronted with a bill for unwanted membership, in the case of acquisition by a cooperative. But where the system to be acquired by a newly formed cooperative is *already* a cooperative, the state commissions do not have jurisdiction (in most cases) over the conditions surrounding the acquisition.

In other words, where *company* A is selling out to *cooperative* B, the state commission has a right (in nearly all states) to require that service be continued to existing subscribers, regardless of whether they want to become members in the new cooperative. If the acquiring co-op fails to give this assurance, the state commission may refuse to authorize the transaction for the transfer of the properties. But where *cooperative* B is taking over an older *cooperative* C, the state commission has no jurisdiction, except in a handful of states. Generally, a letter or complaint to the state commission is enough to bring prompt attention in cases where subscribers are suddenly being asked to contribute $25 or $50 to stay on as telephone subscribers.

An example of this situation recently came to the attention of this writer in the case of the Albany (Minn.) Mutual Telephone Association, which is buying

(Continued on page 38)

Transmission Units and Measurements

By B. C. BURDEN*
Member
USITA Plant Committee

[EDITOR'S NOTE: *This is an address prepared by Mr. Burden and presented before the Plant Conference of the recent convention of the United States Independent Telephone Association by P. K. Fugate, Springfield, Ill.*]

IN RECENT years, there has been a substantial "up grading" of transmission in many Independent exchanges. The importance of good transmission is now appreciated by every alert and progressive plant manager. We have lost our early day reputation as the "whoop and holler" segment of the industry.

Independent companies should continue this program of improving our talking circuits, particularly in the direction of providing a more uniform grade of transmission on both toll and local exchange calls. Special effort should be put forth to bring transmission on rural lines up to present day standards.

The purpose of this paper is to discuss from the standpoint of the smaller companies some of the primary features of transmission, particularly with respect to the units used and circuit and equipment measurements.

Use of the DB in Transmission Measurements

Modern transmission methods involve the use of the vacuum tube oscillator, the tuned reed, or the inductor alternator as the source of "tone" measuring current and a copper oxide (or vacuum tube) meter to measure the power level at the input and output ends of circuits and equipment.

There is a multiplicity of types of voice frequency power level indicators on the market. Unfortunately, these do not all have the same zero reference level calibrations and this has resulted in some confusion on the part of those who do not work regularly with transmission measuring equipment. Let us examine briefly some of the complications in the use of transmission measuring equipment.

By definition, the decibel (db) represents *the ratio of two amounts of power which differ by a fixed and defined amount.* In its application to the telephone field, the decibel may be used to express the loss or gain in a circuit or through a piece of equipment by simply using it as a ratio between the input and output powers.

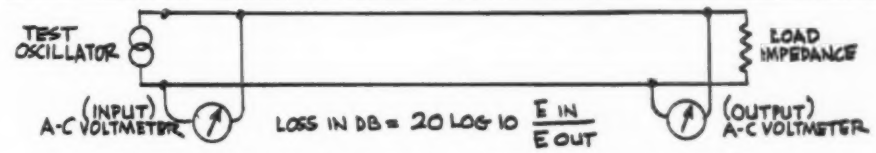
This use expressed in its simplest terms, consists in measuring (usually at 1,000 cycles) the voltage at the input and the output ends of the line or equipment under test. The loss or gain is then readily determined by simply taking the ratio of the input and output voltages (assuming equal input and output impedances) and converting the ratio obtained to decibels by the use of transmission tables such as those given in this paper.

It will be noted this use of the decibel requires no knowledge of input and output impedances so long as these are approximately equal, nor does it make use of a zero reference level.

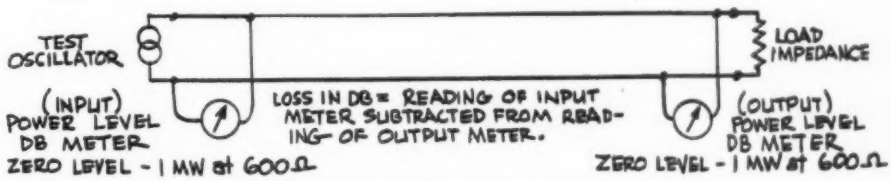
The second use of the decibel in the telephone field and one which has led to some confusion, is as a *zero reference level.* In this application of the decibel a fixed quantity of power is established as a reference point to which other power level measurements can be "referred" to determine the loss or gain in db's of telephone circuits.

The loss or gain expressed in db's as obtained in a measurement made by Method No. 2 would be precisely the same as if made by Method No. 1. The principal difference would be that, in Method No. 2, the meters used would usually be direct reading decibel meters and the loss or gain of the circuit would be obtained by simply subtracting the output from the input reading.

It is apparent that meters of the direct reading type (i.e. calibrated in terms of a zero reference level) would be somewhat easier to use than would ordinary voltmeters as the latter would necessitate some computation



(a) Use Of Decibel As A Ratio To Express Loss Or Gain Of Input Or Output Power.


TEST OSCILLATOR
LOAD IMPEDANCE
(INPUT) POWER LEVEL DB METER
ZERO LEVEL - 1 MW at 600Ω
LOSS IN DB = READING OF INPUT METER SUBTRACTED FROM READING OF OUTPUT METER.
(OUTPUT) POWER LEVEL DB METER
ZERO LEVEL - 1 MW at 600Ω

(b) Use Of Decibel In Conjunction With A Zero Reference Level To Express Loss Or Gain.

Fig. 1. The two applications of the decibel.

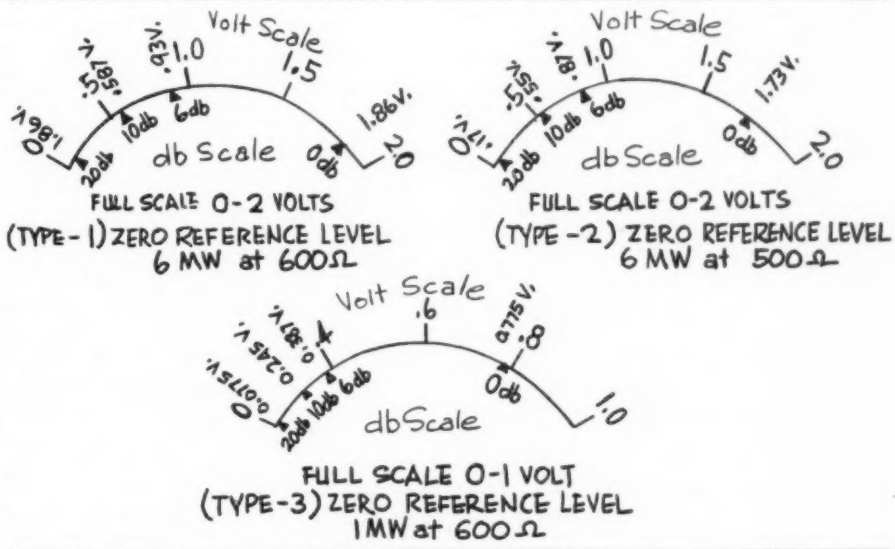


Fig. 2. Various reference levels in common use.

*Burden is a consulting engineer with headquarters in Lincoln, Neb.

XUM

and reference to db tables in order to determine the loss or gain of a circuit.

Direct reading decibel meters offer the further advantage of giving at a glance the input power level to the circuit or equipment under test. This makes it easier to limit or adjust the input power to some predetermined sending value.

The essential difference between the two methods is shown by *Fig. 1.*

Transmission Meter Calibrations

Transmission (power level) meters are essentially ac voice frequency voltmeters with dials calibrated in decibels at some defined *zero reference level.*

In using a transmission meter, it is essential, if readings are to be accurate, that, if different instruments are used to take the input and output readings, they be calibrated for the same zero reference level.

Instruments, now in general use for transmission measurements, are usually calibrated in terms of one of the following zero reference levels *(see Fig. 2).*

Type (1)—.006 watts to 600 ohms. (1.86 volts) (six milliwatt).

Type (2)—.006 watts at 500 ohms. (1.73 volts) (six milliwatt).

Type (3)—.001 watts at 600 ohms. (0.775 volts) (one milliwatt).

The db and the DBM

The Bell System some years ago standardized on a .001 watts at 600 ohms as zero reference level for instruments and measurements. *This standard is recommended to all Independent companies.*

In an effort to avoid error and misunderstanding in the use of the decibel in connection with zero reference levels, the Bell System in recent years has introduced the term *DBM.* This new unit or designation ties down the decibel, when used for power level measurements, to a fixed zero reference level. This level is .001 watt (one milliwatt) taken at an impedance of 600 ohms, i.e., 0 dbm equals .001 watt at 600 ohms.

A meter calibrated to read in DBM's is exactly the same as a meter calibrated to read db's at 600 ohms so far as the significance and magnitude of the readings are concerned.

To illustrate the merit of the new unit, suppose two wire chiefs at opposite ends of a long toll line are measuring the loss of the circuit. If the wire chief at office A advises the wire chief at office B that he is feeding a plus five (+5) db level into the line, the wire chief at office B will have to ask "What is your zero reference level?" But if the wire chief at office A says instead, "I am sending at a plus five (+5) dbm level," then office B immediately knows that the zero reference level is one milliwatt at 600 ohms.

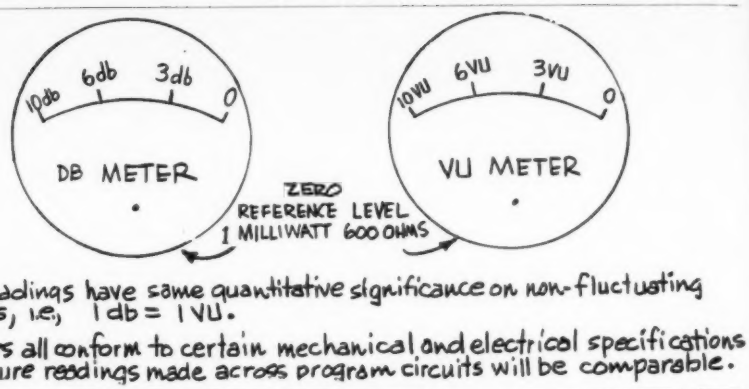

10db 6db 3db 0
DB METER
10VU 6VU 3VU 0
VU METER
ZERO REFERENCE LEVEL
1 MILLIWATT 600 OHMS
* Meter Readings have same quantitative significance on non-fluctuating currents, i.e., 1 db = 1 VU.
* VU Meters all conform to certain mechanical and electrical specifications which insure readings made across program circuits will be comparable.

Fig. 3. Basic difference between DB and VU meters.

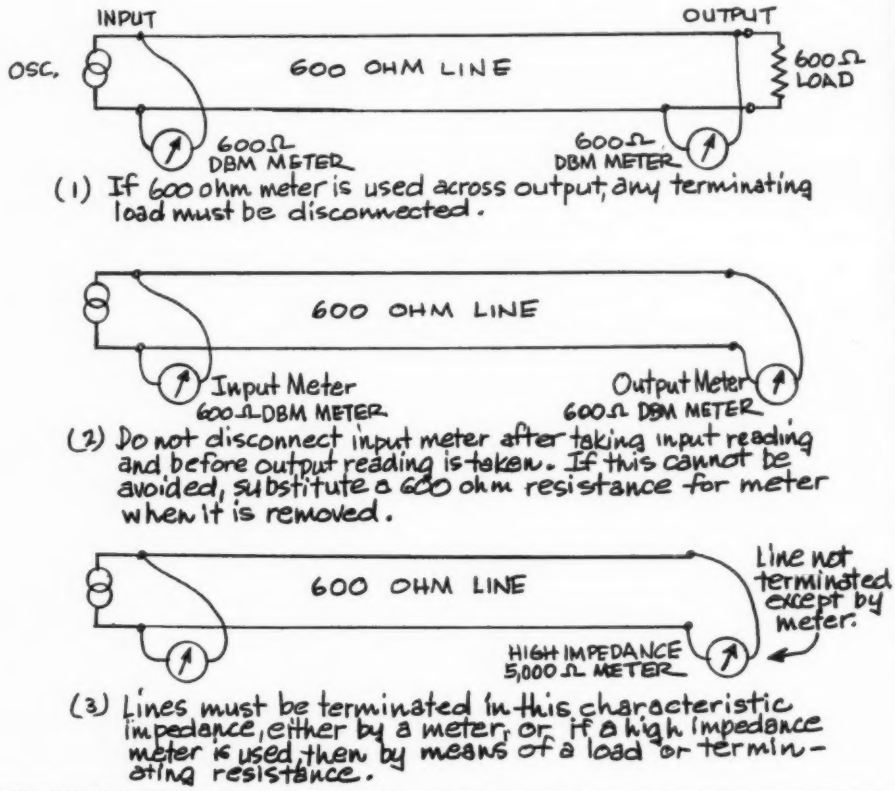

INPUT
OUTPUT
OSC.
600 OHM LINE
600Ω LOAD
600Ω DBM METER
600Ω DBM METER
(1) If 600 ohm meter is used across output, any terminating load must be disconnected.
600 OHM LINE
Input Meter 600Ω DBM METER
Output Meter 600Ω DBM METER
(2) Do not disconnect input meter after taking input reading and before output reading is taken. If this cannot be avoided, substitute a 600 ohm resistance for meter when it is removed.
600 OHM LINE
Line not terminated except by meter.
HIGH IMPEDANCE 5,000Ω METER
(3) Lines must be terminated in this characteristic impedance, either by a meter, or if a high impedance meter is used, then by means of a load or terminating resistance.

Fig. 4. Typical sources of measurement errors.

As a further illustration of how the use of different reference levels at the two ends of a circuit can result in error, consider the following case. Assume at office A a power level meter with a zero reference level of .006 watt at 500 ohms is being used whereas office B uses a meter with a zero level of .001 watts at 600 ohms. If office A sends tone at 0 db and the received level as shown by the meter at office B is −10 db, it would appear the line loss was 10 db but actually the loss would be approximately 17 db.

In other words, a power level meter of the decibel type is simply an ac voltmeter of some fixed impedance and with a scale calibrated in decibels instead of volts. The voltage corresponding to a zero db reading on one of these meters will depend on the impedance and reference power level at which the meter is calibrated. Unless power level meters have the same reference level calibration, their respective decibel readings cannot be directly used in a transmission computation unless correction factors are applied.

The Volume Unit (VU)

As a further step toward simplification and standardization of transmission units, there has also been introduced in recent years another unit known as the volume unit (VU). This unit was established *to be used with special power level meters* designed to measure the peak and average volume (power) levels on public address, radio

program and other similar circuits in which both the frequencies and instantaneous level of the currents carried vary widely. As is later explained, VU meters are built to conform to certain rigid specifications with respect to the characteristics of the meter movement employed.

This need for a VU meter was generated by the fact that it is difficult to establish and maintain standards with respect to minimum and maximum levels at which fluctuating speech and music circuits and equipment should be operated without standardizing the instruments used to measure these levels.

Ordinary power level meters of the db or dbm type, and having identical scales, will give widely different results when reading peak or average levels on speech and music circuits. This is due to the difference in the D'Arsonval movements employed. One movement might be heavily damped whereas another would have very little damping. Although they would give identical readings on currents having constant frequency and level, the readings would vary widely on speech or music measurements.

The VU has the same quantitative significance as the dbm. In other words, one VU equals one db with a zero reference level of .001 watt at 600 ohms; hence, readings expressed in VU's represent the same power level as they would if expressed in dbm's, or db's at a reference level of .001 watt at 600 ohms, and *provided we are considering a fixed frequency and unfluctuating power level.*

As already stated, the VU is used primarily with special VU meters. These meters are built to fit prescribed specifications covering the resistance, damping, and ballistic characteristics of the meter movement.

Because all VU meters have identical mechanical and electrical characteristics, volume level measurements made with them across circuits carrying fluctuating speech and music currents will have the same significance and will be comparable.

In the telephone field, the DBM meter should be considered as the future standard for constant frequency measurements, and the VU meter the standard for use on program type circuits. However, it is of course feasible to use VU meters for ordinary transmission measurements.

Decibels		Ratios		Decibels		Ratios	
For Current or Voltage Ratio	For Power Ratio	Amplification Ratio (Gain)	Attenuation Ratio (Loss)	For Current or Voltage Ratio	For Power Ratio	Amplification Ratio (Gain)	Attenuation Ratio (Loss)
1	0.5	1.122	0.891	51	25.5	355	0.00282
2	1.0	1.259	0.794	52	26.0	398	0.00251
3	1.5	1.413	0.708	53	26.5	447	0.00224
4	2.0	1.585	0.631	54	27.0	501	0.00200
5	2.5	1.778	0.562	55	27.5	562	0.00178
6	3.0	1.995	0.501	56	28.0	631	0.00158
7	3.5	2.24	0.447	57	28.5	708	0.00141
8	4.0	2.51	0.398	58	29.0	794	0.00126
9	4.5	2.82	0.355	59	29.5	891	0.00112
10	5.0	3.16	0.316	60	30.0	1000	0.00100
11	5.5	3.55	0.282	61	30.5	1120	0.000891
12	6.0	3.98	0.251	62	31.0	1260	0.000794
13	6.5	4.47	0.224	63	31.5	1410	0.000708
14	7.0	5.01	0.200	64	32.0	1580	0.000631
15	7.5	5.62	0.178	65	32.5	1780	0.000562
16	8.0	6.31	0.158	66	33.0	2000	0.000501
17	8.5	7.08	0.141	67	33.5	2240	0.000447
18	9.0	7.94	0.126	68	34.0	2510	0.000398
19	9.5	8.91	0.112	69	34.5	2820	0.000355
20	10.0	10.0	0.100	70	35.0	3160	0.000316
21	10.5	11.2	0.0891	71	35.5	3550	0.000282
22	11.0	12.6	0.0794	72	36.0	3980	0.000251
23	11.5	14.1	0.0708	73	36.5	4470	0.000224
24	12.0	15.8	0.0631	74	37.0	5010	0.000200
25	12.5	17.8	0.0562	75	37.5	5620	0.000178
26	13.0	20.0	0.0501	76	38.0	6310	0.000158
27	13.5	22.4	0.0447	77	38.5	7080	0.000141
28	14.0	25.1	0.0398	78	39.0	7940	0.000126
29	14.5	28.2	0.0355	79	39.5	8910	0.000112
30	15.0	31.6	0.0316	80	40.0	10000	0.000100
31	15.5	35.5	0.0282	81	40.5	11200	0.0000891
32	16.0	39.8	0.0251	82	41.0	12600	0.0000794
33	16.5	44.7	0.0224	83	41.5	14100	0.0000708
34	17.0	50.1	0.0200	84	42.0	15800	0.0000631
35	17.5	56.2	0.0178	85	42.5	17800	0.0000562
36	18.0	63.1	0.0158	86	43.0	20000	0.0000501
37	18.5	70.8	0.0141	87	43.5	22400	0.0000447
38	19.0	79.4	0.0127	88	44.0	25100	0.0000398
39	19.5	89.1	0.0112	89	44.5	28200	0.0000355
40	20.0	100	0.0100	90	45.0	31600	0.0000316
41	20.5	112	0.00891	91	45.5	35500	0.0000282
42	21.0	126	0.00794	92	46.0	39800	0.0000251
43	21.5	141	0.00708	93	46.5	44700	0.0000224
44	22.0	158	0.00631	94	47.0	50100	0.0000200
45	22.5	178	0.00562	95	47.5	56200	0.0000178
46	23.0	200	0.00501	96	48.0	63100	0.0000158
47	23.5	224	0.00447	97	48.5	70800	0.0000141
48	24.0	251	0.00398	98	49.0	79400	0.0000126
49	24.5	282	0.00355	99	49.5	89100	0.0000112
50	25.0	316	0.00316	100	50.0	100000	0.0000100

Table No. 1—Decibel conversion values (1.0 db steps for voltage and current ratios); (0.5 db steps for power ratios).

Transmission Measurements

Transmission measurements are normally made for one of the following reasons:

(1) To check circuits and equipment to locate specific reported transmission trouble.

(2) To line up circuits in connection with the installation or maintenance of carrier or repeater equipment.

(3) To periodically routine test an office or exchange as a means of locating faults which impair transmission, yet would normally be overlooked.

Many of the larger companies conduct an annual check of transmission on COE, toll lines, and in some cases, rural lines. A surprising number of cases of transmission impairment is uncovered by these periodic checks. This is particularly true on exchanges which are being checked for the first time.

The simplest type of transmission check is a talking test between the wire chief's or operator's telephone and a subscriber or a distant office. However, such tests are inconclusive as a means of determining the precise transmission efficiency of a telephone circuit as they often fail to disclose circuit or equipment defects which substantially impair service, particularly on long connections.

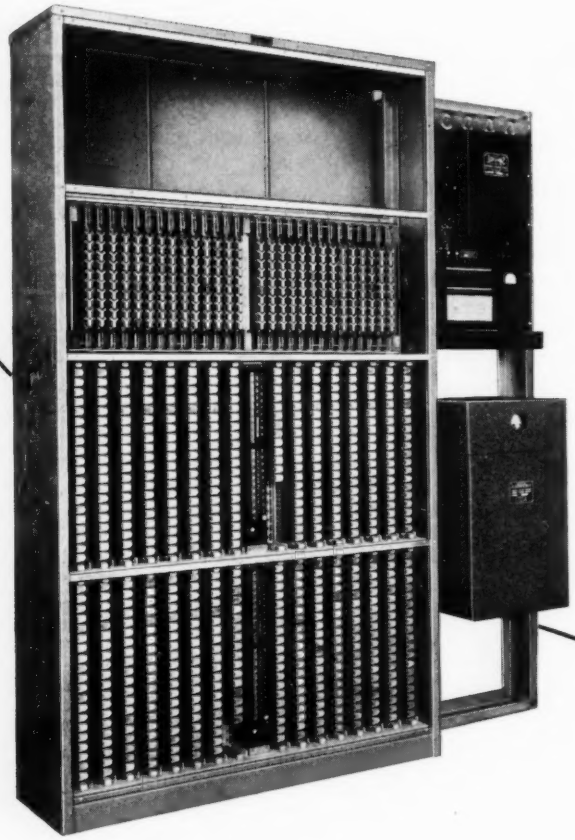
An improvement on the simple talking test is an arrangement whereby a 20 db resistance network (loss pad) is inserted in series with the wire chief's talking circuit and talking tests made through this pad to subscribers or wire chiefs in other offices. The effect of the inserted loss is to make more readily apparent to the testing

(Please turn to page 34)

READ WHY

all these exchanges chose

the LEICH dial system



SIMPLIFIED OPERATION

The Leich Dial System is a greatly simplified relay type dial switchboard. It uses fewer parts, has less to go wrong, is easier to understand and maintain. All operations are performed by full-size, heavy-duty, positive-acting relays. There are no moving mechanical devices to wear and require maintenance or adjustment.

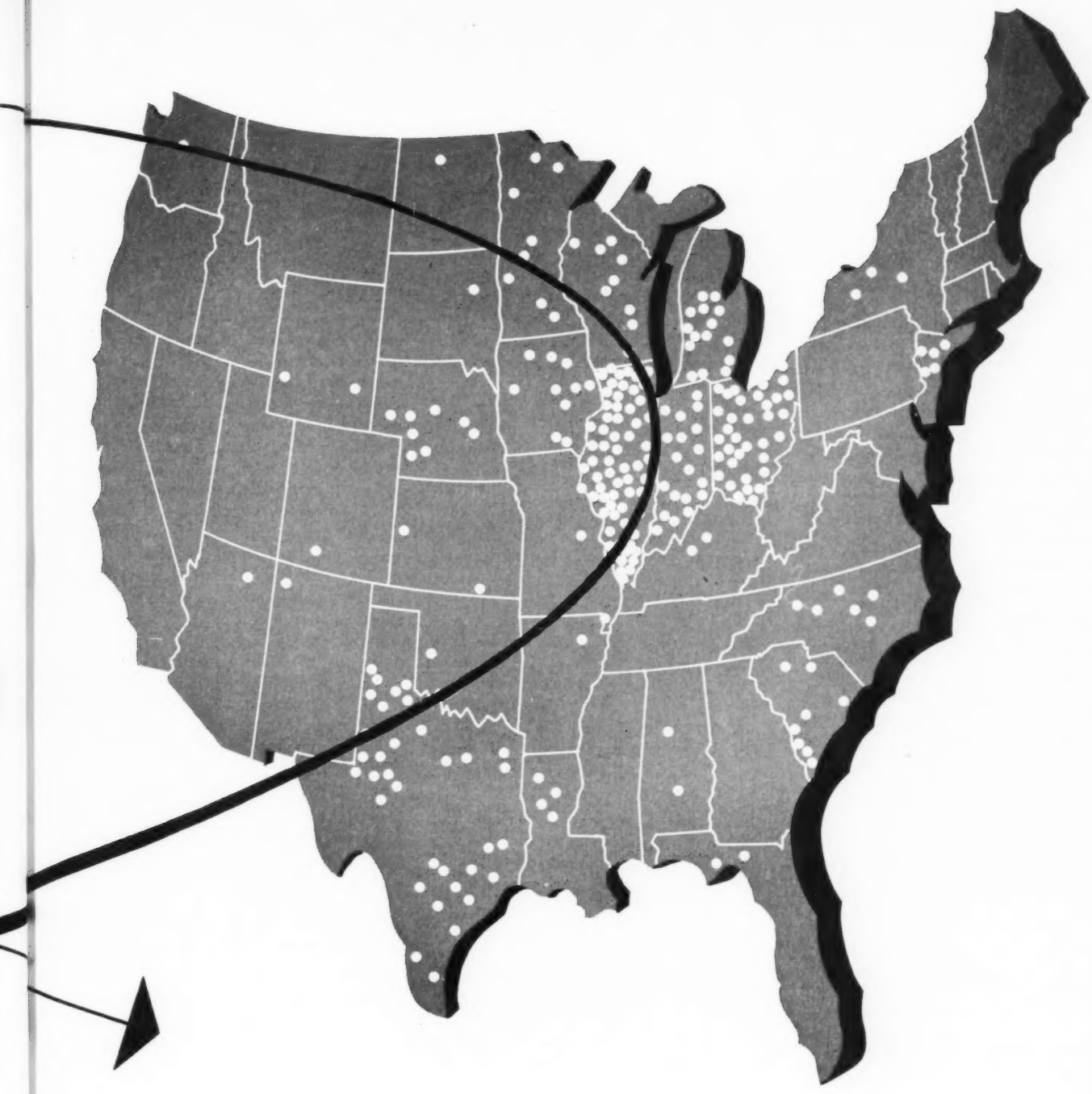
EASY TO EXPAND

The Leich Dial System protects you fully in case your exchange grows. It is less work and expense to add lines and links to the Leich Dial System. Your own man can jack-in ten additional lines in ten minutes and an extra 100-line link connecting circuit in an hour or two. No factory installers are necessary.

DEPENDABLE PERFORMANCE

Leich relay switches have withstood ten million operations without readjustment, replacement or signs of wear. Leich relays have been tested for 25 million operations with no failures. The relay make and break springs are preformed to insure correct contact pressure. This dependable relay operation keeps maintenance costs down.

LEICH M



BETTER SERVICE

All desirable service features, including nation-wide toll dialing, are provided for in the Leich Dial System. Relay type switchboards are known for their speed in completing calls and the Leich Dial System is no exception. Another feature that makes for good service is ample linkage to take care of traffic overloads. The Leich system has a capacity of 15 links for every 100 lines.

QUICKER, LESS EXPENSIVE INSTALLATION

Saves you time and money. Switchboard bays come fully wired for 100 lines and 15 links. The parts come in small packages, ready to jack-in. One man, with a helper, can install a 100-line Leich Dial System in a week or ten days.

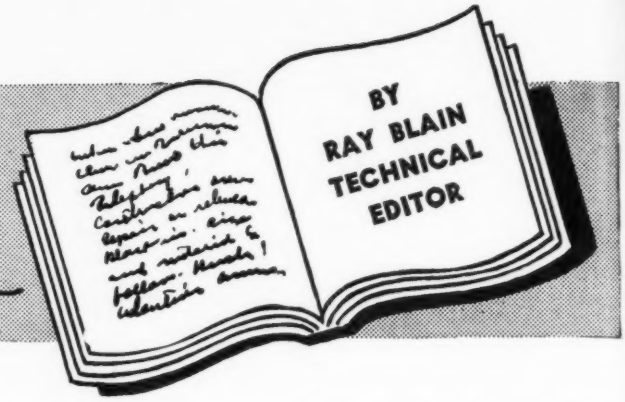
GREATER PROFIT POSSIBILITIES

Simplified operation and maintenance, dependable service, all-relay operation, inexpensive jack-in expansion, quick installation ... all these features add up to a more profitable dial conversion. The growing list of telephone companies that have chosen the Leich Dial System is proof indeed of its profit possibilities. Write today for complete information. **Leich Sales Corporation, 427 West Randolph Street, Chicago 6, Ill.**

H MANUFACTURERS OF TELEPHONES, SWITCHBOARDS AND RELATED APPARATUS SINCE 1907

XUM

THE PLANT MAN'S *note book*



BY RAY BLAIN TECHNICAL EDITOR

SOME expert has predicted that this country will have over 100 million telephones by the year 2,000.

When we travel around the country and note the many areas of thousands of new homes, equipped with television antennas and waiting for a telephone, we cannot doubt that this prediction will come to pass.

Forecast studies of telephone requirements are of no value in most communities unless revised and brought up-to-date daily.

• • •

Someone has said that if ever a new Statue of Liberty is designed it will be holding the bag instead of the torch.

• • •

A new automobile accessory is a keyhole anti-freeze, a chemical compound that protects locks from freezing. Squirt this transparent liquid into the keyhole; it lasts for life of the car.

• • •

Television isn't replacing radio half as fast as it is homework.

• • •

Western Electric Co. reports that equipment for a 10,000 line crossbar central office weighs more than most freight locomotives. Actually, there are 500 tons of equipment in such an office. Nearly 200,000 man-hours of labor are required to fabricate the equipment in the factory and about 60,000 man-hours to install it.

• • •

It seems rather strange, in this modern age of communication, that more general use is not made of auxiliary types of telephone signals.

A relay set is available at a reasonable cost that will operate from standard ringing current and can be used to supplement or replace the standard telephone ringer. This relay, in turn, closes a secondary circuit which will control commercial power that can be used to light lamp signals, operate loud ringing bells, sirens, or chimes.

Perhaps these devices would be used more generally if operating companies would inform their customers that this special service can be made available.

• • •

Someone has said that it is not smart to argue with a fool; listeners can't tell which is which.

• • •

We are indebted to our good friend D. K. Foley, of the West Coast, for a copy of Dublin, Ireland, and the Irish Free State telephone directory. The classified section carries listings of business firms under appropriate headings as "butter and cream merchants," but has little advertising.

Small ads do appear at the top and bottom of some pages throughout the directory. Also, at the top of each page appear slogans such as "answer with the promptitude you expect."

We note with interest that rentals are payable quarterly in advance on Jan. 1, Apr. 1, July 1 and Oct. 1. A subscriber is required to deposit a sum sufficient to cover two-thirds of a quarter's account for local, trunk and telegram charges. The minimum deposit is one pound 10 shillings per circuit.

It is interesting to note that if apparatus at the subscriber's office is damaged by fire or otherwise, he is liable for making the damage good. Subscribers are advised, therefore, to cover their liability by insuring each exchange line instrument for at least five pounds.

The following statement is made with reference to foreign attachments and disinfection services:

"Vendors of appliances for attachment to telephones and agents of disinfection services usually approach subscribers to purchase such articles or subscribe to such services on the ground that they improve the service or have some hygienic advantage. Subscribers are reminded that, under the conditions of their Agreement with the Department, the use of such appliances is, in general, prohibited and, further, that subscribers are responsible for the proper care of their instruments and would be liable for any damage caused by the use of such attachments or of an unsuitable disinfectant. The sale to the public of certain appliances which have no such prejudicial effect is permitted and, before purchasing any telephone attachments, subscribers should communicate with the secretary, Department of Posts and Telegraphs, in order to ensure that there is no official objection to their use. Post Office Engineers have instructions to remove any attachment likely to damage the apparatus or to have an adverse effect on the service."

While the wording is somewhat different, the Irish do have about the same rules as we have concerning the use of foreign attachments. One thing I have not been able to figure out is a reference to "Telephone Silence Cabinets." It is assumed, however, that this is a public telephone booth.

• • •

Someone has said that it takes real courage to hold fast to one's idea when it causes him to be looked upon as strange and eccentric.

• • •

We note that cable splicers in the Washington, D. C., area seem to be working almost around the clock and we wonder if they ever sleep.

It is a common sight to drive down a street at night and see obstruction lights of the blinking type, operated from a storage battery, used to protect a cable splicer's tent set up over a manhole. The splicer's truck is parked nearby and he and his helper are hard at work twisting wires.

Despite the efforts of these men and their long hours of overtime work, many new homes in this area have been waiting several months for a telephone.

PLANT MAN'S QUIZ

Q. During the past few years while we have been checking rural line stations in our exchange, we find more and more cases of ringer coils becoming magnetized permanently, usually on one side. Also, almost invariably this type of trouble occurs in areas served by REA-financed companies. The troubles found are usually where our subscriber also has REA power in his house. This trouble is especially noticeable on long heavy lines where the armature clings firmly to one of the permanent magnets and will not release on ringing current to operate the bells. Can you suggest a permanent remedy?

A. From the information furnished, we doubt very much if the ringer magnets actually are magnetized permanently. The core of electromagnets used in telephone ringers are composed of very soft iron so that they will not retain residual magnetism. We are of the opinion that you have a standing voltage of some sort on your line that is pulling the ringer armatures to one side.

It is suggested that you first test the line with a voltmeter, if you have one of a suitable type available, to detect any foreign voltage. If you do not have a voltmeter suitable to make this test, then open the ringer, by disconnecting it from the line, and note whether or not the armature releases. If the armature is now free, connect it up in reverse and note whether or not it swings to the other side of the ringer. If this action occurs, you can be certain that there is a standing voltage on the line that is operating the ringers.

You do not state whether this condition occurs on metallic or grounded lines. If you are using a grounded line, this standing voltage may be due to a difference of ground potential.

It is our opinion that an induced voltage is being picked up in some manner from the REA power lines you mention. That the effect is more serious on long, heavy lines in REA territory causes us to suspect that induced voltage is the actual cause of your difficulty.

While it is true that power lines are alternating current, sometimes a rectifier action on a telephone line causes leakage or induction to have the effect of direct current.

If your trouble is due to leakage or induction, make sure that the lines are all clear of tree interference and that all broken or cracked insulators are replaced. Make certain, also, that all protectors are clear of grounds and leakage. The line should be carefully transposed to reduce inductive interference to a minimum. It may also be necessary to resort to the use of drainage coils of some type.

Make certain, too, that the power system and the telephone line are not connected to the same water pipe or ground rod.

• • •

Q. We have several miles of underground Spiral-Four army surplus cable installed in our exchange. When we first installed the cable, it gave very good service on magneto lines. At that time, each pair tested clear of leakage. Now, however, we have high resistance to ground on all conductors. We would be pleased to know how we may locate and clear this trouble. Will it prove desirable to vulcanize a protective covering over each splice?

A. First, it should be pointed out that this type of cable never was designed for use on a permanent underground telephone system. The connectors attached to the ends of the sections of cable of this type are practically water-tight when first made. If, however, these connectors are buried, even though they may be protected by tape covering, they eventually may collect moisture and cause trouble of the nature you describe.

If you have leakage at each splice, then it appears that every splice must be opened, dried out and remade. Splicing of this type of cable after the connectors are removed proves a rather difficult and expensive operation. Vulcanizing an outer jacket over the splice is especially expensive. We seriously doubt that the cable would be worth the cost of splicing in this manner.

We suggest that you first open up the center splice in your cable run and test in both directions. If both ends show leakage, then proceed to open each splice, dry them out well and remake. Cover these splices first with two layers of rubber tape, and then with several reverse layers of friction tape. Each layer of friction tape should be well painted with asphaltum of P&B.

If local conditions are favorable, it might prove desirable to bring the cable above ground at each splice and connect to a pedestal-mounted terminal. These terminals may then be used for distribution and testing. Again, this method would prove rather expensive.

A cable-splicing housing of a new type now under development, when available, should prove ideal for the splicing of cables of this type.

• • •

Q. When a turret-type ladder is mounted on a telephone maintenance truck, what type of power can be used to elevate it to a working position?

A. Three different types of power are used for this purpose by the manufacturer of one such ladder. Either the hand crank or windlass, manually operated, hydraulic pump and cylinder or a 6-volt electric pump and cylinder that operates direct from the truck's storage battery.

"DEAR ME, MAMA ALMOST FORGOT TO PICK UP A SPOOL OF GREEN COTTON THREAD NUMBER 8."

V V

"Statistics bear out the fact that we Americans have boosted our total annual income considerably from the year 1929. In fact the actual figures show that in 1929 the total annual income was about 87 billion dollars, but last year a total of 239 billion dollars, or a 175 per cent increase was grossed by wage earners of this nation. But back of it all is the fact that the government has been doing some increasing on its own account. Factually, it has increased appropriations from 4.7 billion dollars to more than 52.8 billion dollars, and it has run up the national gross debt from less than 17 billion dollars to more than 257 billion dollars."—Newberry (S. C.) Observer

V V

"The National Production Authority (NPA) work in my department could not have been undertaken nor carried on without the valued help of experienced businessmen who know what they are doing when they deal with business problems."—Charles Sawyer, Secretary of Commerce.

XUM

REA Releases Preview on U.S. Farm Telephone Census

ALTHOUGH there were nearly 400,000 fewer farms with telephones in 1950 than in 1920, the percentage of farms with telephones rose in 28 states and dropped in 20 states. These figures were released by the Rural Electrification Administration (REA), based on preliminary 1950 census statistics. This paradoxical result was apparently due to the drop in the total number of farms, and the reclassification of telephone service in areas shifting from rural to urban or suburban as the result of annexation, subdivision, etc.

The REA announcement gave the total number of farms with telephones as of Apr. 1, 1950, as 2,059,474 (38.3 per cent of total farms), as compared with 2,498,493 in 1920 (38.7 per cent). Another difficulty has been the changing definition of "farm" by the government. In 1949, REA estimated the total number of farm telephones at 2,473,000, or 42.2 per cent of the total number of farms. Obviously, in the light of *steady farm telephone expansion* since that time, there could not have been an actual physical loss of more than 400,000 farm facilities, as the comparison of the 1949 estimate with the 1950 figure would indicate.

Gains of better than 30 per cent in farms with telephones during the past 30 years were registered in four states: Connecticut, which led all states in the number of farm telephones (totaling 83.8 per cent of total farms), Delaware (67 per cent), New Jersey (71.8 per cent), and Rhode Island (76.9 per cent).

Percentage gains from 20 per cent to 30 per cent were shown in Arizona, California, Colorado, Idaho, Maryland, Massachusetts, New Hampshire, New York, and Utah. The largest percentage loss (16.6) was shown in West Virginia, totaling 26.7 in 1950 as compared with 43.3 in 1920. Iowa, which led the country with a total of 86.1 per cent of farms with telephones in 1920, slipped to second place—81.9 per cent in 1950.

Another noteworthy feature pointed out by REA is that 80 per cent of the nation's farms are located in the 27 states showing numerical (as distinguished from percentage) farm telephone losses between 1920-1950. Discontinuance during the depression years of a number of small farmer mutual telephone systems, which reached their peak development around 1920, is believed largely responsible for this. If the 1950 comparison had been made with 1940 census figures, when only one-fourth of the nation's farms had telephones, a 13.3 per cent gain during the last decade would be indicated.

[**Editor's Note:** *A last-minute comparison of the farm telephone census for 1940, 1945 and 1950, shows that every state had an increase in farm telephones for those years. For the nation as a whole, 25.04 per cent of all farms had telephones in 1940; 31.85 per cent had telephones in 1945, and 38.3 per cent had telephones in 1950. Why REA insists on comparing farm telephones in 1920 with 1950, when the definition of a farm was different, is difficult to see, unless it desires to show up the telephone industry in an unfavorable light.*

This analysis of farm telephone statistics was prepared by our Washington editor, Francis X. Welch.]

The table on this page shows the census statistics released by REA with the exception of the column "% Gain or Loss 1920-1950."

Farms with Telephone Service, 1920 and 1950, as Reported by the Census of Agriculture (Preliminary Data for Apr. 1, 1950)

State	1920 Number	1920 % of All Farms	1950 Number	1950 % of All Farms	% Gain or Loss 1920-1950
UNITED STATES	2,498,493	38.7	2,059,474	38.3	— .4
Alabama	38,407	15.0	17,442	8.3	— 6.7
Arizona	1,638	16.4	4,408	42.3	+25.9
Arkansas	52,869	22.7	19,191	10.5	—12.2
California	37,309	31.7	78,720	57.4	+25.7
Colorado	22,022	36.7	27,048	59.3	+22.6
Connecticut	11,738	51.8	13,081	83.8	+32
Delaware	2,763	27.2	4,990	67.0	+39.8
Florida	4,524	8.4	10,192	17.9	+ 9.5
Georgia	29,861	9.6	18,619	9.4	— .2
Idaho	13,837	32.9	22,264	55.3	+22.4
Illinois	173,572	73.2	127,618	65.4	— 7.8
Indiana	136,140	66.4	102,994	61.8	— 4.6
Iowa	183,852	86.1	166,380	81.9	— 4.2
Kansas	128,753	77.9	89,760	68.3	— 9.6
Kentucky	73,145	27.0	45,507	20.8	— 6.2
Louisiana	8,599	6.3	14,334	11.5	+ 5.2
Maine	23,632	49.0	19,467	64.1	+15.1
Maryland	11,755	24.5	19,457	53.8	+29.3
Massachusetts	16,537	51.7	17,319	77.9	+26.2
Michigan	97,874	49.8	83,134	53.4	+ 3.6
Minnesota	110,568	62.0	107,359	59.9	— 2.1
Mississippi	28,260	10.4	16,425	6.5	— 3.9
Missouri	163,543	62.2	106,673	46.4	—15.8
Montana	9,781	17.0	9,995	28.5	+11.5
Nebraska	95,050	76.4	69,541	64.9	—11.5
Nevada	1,122	35.5	1,550	49.8	+14.3
New Hampshire	10,166	49.5	10,055	75.1	+25.6
New Jersey	9,484	31.9	17,829	71.8	+39.9
New Mexico	3,359	11.3	3,500	14.8	+ 3.5
New York	91,973	47.6	88,746	71.0	+23.4
North Carolina	33,029	12.2	23,347	8.1	— 4.1
North Dakota	36,349	46.8	27,214	41.6	— 5.2
Ohio	159,478	62.1	119,718	60.1	— 2.
Oklahoma	71,613	37.3	47,161	33.2	— 4.1
Oregon	25,351	50.5	30,104	51.3	+ .8
Pennsylvania	87,887	43.5	76,511	52.1	+ 8.6
Rhode Island	1,685	41.3	1,998	76.9	+35.6
South Carolina	10,943	5.7	11,901	8.5	+ 2.8
South Dakota	44,327	59.4	37,221	56.1	— 3.3
Tennessee	56,880	22.5	43,541	18.8	— 3.7
Texas	140,234	32.2	79,079	23.8	— 8.4
Utah	6,295	24.5	12,515	51.8	+27.3
Vermont	16,752	57.6	13,267	69.7	+12.1
Virginia	33,482	18.0	35,853	23.7	+ 5.7
Washington	27,952	42.2	40,166	57.5	+15.3
West Virginia	37,789	43.3	21,724	26.7	—16.6
Wisconsin	111,798	59.1	99,821	59.2	+ .1
Wyoming	4,449	28.1	4,735	37.5	+ 9.4
Alaska	——	—	86	16.4	——
Hawaii	——	—	2,010	35.0	——

Predicts Copper Shortage to Increase 'Held Order' Lists

MORE than a million people who will want service from Bell System companies in 1952 will not get it, as a result of failure of the National Production Authority (NPA) to allocate needed amounts of copper to Bell companies, the American Telephone & Telegraph Co. stated on Dec. 18. (See "In the Nation's Capital," Dec. 22, p. 13.) For the first quarter of 1952, the companies have been allocated copper supplies 25 per cent below their requirements.

The Bell System now has a waiting list of 800,000 people who want telephone service and cannot get it. If copper allocations continue at present levels, this list will grow to more than a million by the end of 1952. Of this number, about 150,000 will be telephone customers who moved to new addresses and found no facilities available. In addition, the list of approximately 1,800,000 party line users who want—and many of whom urgently need—better grades of service will pass the 2 million mark before the end of next year.

Bell telephone companies have added equipment to serve 15 million new telephones in the last six years. Despite this record-breaking construction job, the country faces the next phase of the defense program with its communications system overloaded, and with no spare facilities to handle any widespread upsweeps in demand.

Overloading of the country's communications facilities can be relieved only by enlarging the system, the companies say, and enlargement depends on an adequate supply of copper.

Construction programs for 1952 were designed to make further progress in catching up with demands. The carefully documented needs of the business, as presented to NPA, call for 19,000 tons of copper for the first quarter. These needs take into account stringent conservation methods and maximum use of substitutes. However, NPA allocated only 14,400 tons.

One of the usual sources of copper in the industry is scrap recovered from telephone operations. In the last quarter of 1951, this amounted to 1,000 tons a month. This metal now goes back into the national copper pool, and is not credited to telephone companies in their NPA allotment, according to AT&T.

"Telephone companies have pointed out to the National Production Authority that no other essential industry is in such short supply of its goods or services today. The special needs of government and defense agencies, which telephone companies are meeting fully, take a sizeable portion of their copper allocations. Large amounts of copper are needed to serve defense activities, military establishments, civil defense, servicemen in camps and hospitals, new defense industrial plants and associated housing developments," the AT&T said.

In addition to the copper requirements of the Bell System, the nearly 6,000 Independent telephone companies face an urgent need for a greater allotment of this critical material if they are to reduce their "held orders" and meet the demand for telephone service.

"I REFUSE TO CALL 'EM UNTIL I LOOK UP THEIR NUMBER IN THE *LATEST* DIRECTORY!"

V V

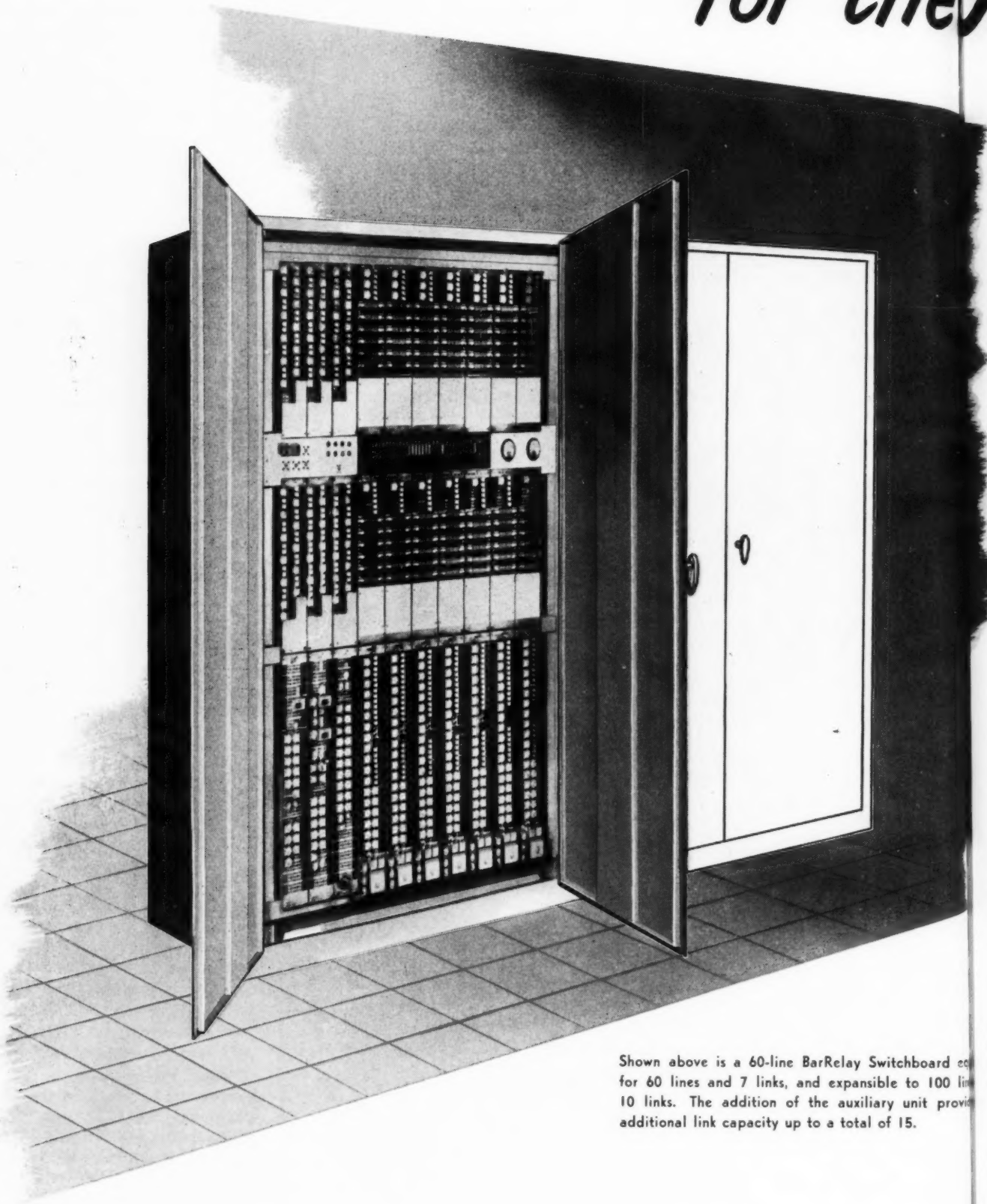
"Government spending this year will total 88 billion dollars—more than the entire national income in the boom year of 1929. Per capita cost has risen . . . to $580 for this year's spending, or 40 per cent of the average per capita income of $1,435. Experience has it that when the tax take goes above 25 per cent of the national income, inflation is here. Present tax bill of 40 per cent places the nation well out on the inflation limb now."—Tombstone (Ariz.) *Epitaph*.

V V

"We are not the first peoples to travel along the road toward complete subjugation by a government's bureaucratic hierarchy, but we at least have the advantage of knowing what has gone before and thus are able to recognize the symptoms that already are beginning to come to the surface."—Wilmington (Cal.) *Press-Journal*.

XUM

For the G



Shown above is a 60-line BarRelay Switchboard eq
for 60 lines and 7 links, and expansible to 100 li
10 links. The addition of the auxiliary unit provi
additional link capacity up to a total of 15.

GROWING Exchange—

BarRelay Flexibility Makes Expansion Easy

Automatic Electric BarRelay Switchboards are designed with an eye to the future of your exchange. When you install BarRelay equipment, you *know* that your exchange will be able to grow as it needs to grow—simply, easily, and at low cost.

Standard small exchange units, partially equipped, are readily expanded to full unit capacity (40, 60, or 100 lines) by the simple addition of ready-wired, factory-assembled 10-line units, and link equipment as needed. For further growth, just add auxiliary units for more lines and links. In addition, BarRelay selector equipment can be provided on the 100-line switchboards for easy and economical expansion to any size.

BarRelay Design Insures Dependability

In BarRelay switchboards, all relays have high-pressure twin contacts of precious metal, and self-protecting coils; and all components are wired with permanent soldered connections. These features assure complete dependability, long life, and minimum maintenance.

With all these features, BarRelay equipment is most attractively priced. We shall be glad to submit facts and figures on BarRelay equipment for your exchange.

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XUM

Courts and Commissions

Proposed Co-op Regulation Bill Defeated in Pennsylvania

A bill which would have placed rural telephone cooperatives in Pennsylvania under jurisdiction of Pennsylvania Public Utility Commission was rejected on Dec. 21 by the state senate.

In urging defeat of the bill, Sen. William J. Lane, Washington County Democrat, asserted that it would hand over rural telephone service to "a monopoly which would not furnish service to remote points."

Sen. Murray Peelor, Indiana County Republican, said cooperative telephone companies, aided by the federal Rural Electrification Administration, serve between 60,000 and 70,000 farmers. He opposed the bill on the grounds that it would harm such service.

V V

Ohio Utilities Commission Issues Anti-Gambling Order

In a four-point order aimed at horse race bookies (TELEPHONY, Oct. 6, p. 34), Ohio State Utilities Commission on Dec. 21 directed:

(1) Telephone and telegraph companies shall not install their services for anyone if they have "good cause to believe" the service will be used for gambling purposes.

(2) Telegraph and telephone companies are ordered to make an investigation on their own initiative any time they have "reasonable cause" to believe their services are being used for gambling purposes.

(3)Telephone and telegraph companies must file copies of all private leased wire contracts with the commission and with local law enforcement officials.

(4) Telephone and telegraph companies must remove facilities any time they are requested to do so by local law enforcement agencies when those agencies have reasonable cause to believe the services are being used for illegal purposes

Asserting that hearings it held on the matter revealed that the communications services are being used by gamblers, the commission said it had adopted the regulations for the best interest of the public.

The commission's order contained all points of a proposed order drawn up some time ago, with one exception. The one point left out of the new order was one which would have required the telephone and telegraph companies to require written applications from those seeking services.

At the hearings, representatives of communication services objected to all points of the order. Objections included one which stated that all points of the order would add new expenses to the companies, but this objection was believed eliminated in part by the commission's failure to ask that the companies demand written application for services.

The original hearings were held on a commission show cause order issued to the communication companies last Apr. 10 (TELEPHONY, Apr. 28, p. 50).

The commission said it was issuing its order based on evidence which appeared to show that telephone services and telegraph services "have been and are being used with frequency in the furtherance of (a) bookmaking, (b) illegal dissemination of racing information (c) and other unlawful organized gambling activities."

V V

FCC Rules on Tariff Relating to 'Unlawful Purpose'

Federal Communications Commission on Dec. 21 announced a decision in which it found that the first sentence of the tariff regulations of American Telephone & Telegraph Co. and Chesapeake & Potomac Telephone Co., relating to the use of telephone services for unlawful purposes (which reads: "The service is furnished subject to the condition that it will not be used for an unlawful purpose.") is not, in and of itself, unlawful.

However, it found that the remainder of this particular tariff (which states: "Service will not be furnished if any law enforcement agency, acting within its jurisdiction, advises that such service is being used or will be used in violation of law, or if the telephone company receives other evidence that such service is being or will be so used.") is unjust, unreasonable, and therefore unlawful. The commission concluded:

". . . The telephone company takes the position that because of the inclusion of this sentence it will be absolved of liability to a subscriber or applicant if the action which it takes with respect to such subscriber or applicant is based upon the advice of a law enforcement agency. Indeed, defendants request 'clarification' of the language of the Initial Decision to put it beyond misunderstanding that they would not be liable. We are of the opinion that the carrier cannot so avoid responsibilities which are implicit in its operation. In giving or in refusing service after receiving the advice mentioned in the regulation, or the 'other evidence,' the carrier must make a decision. That such decision may render it liable in the event of error, either to the subscriber or applicant or to process for aiding and abetting a criminal violation, does not eliminate the carrier's necessity to make the determination. We find nothing in the Communications Act which will permit the carrier to insulate itself from liability for its actions in connection with the rendition or refusal to render service in the manner here sought. To the extent, therefore, that the regulations in question attempt so to protect the carrier they cannot be upheld.

"In addition to the foregoing, we find another reason why this portion of the regulations cannot be sustained. In effect, the carrier binds itself to accept in every case the advice of 'any law enforcement agency, acting within its jurisdiction,' without regard to the nature of the advice. Thus, it is possible that even though it may be within the knowledge of a carrier that the advice given it by a law enforcement agency is unfounded, the regulations would require acceptance of the advice and action in response thereto. In such or comparable situations, the automatic action required by the regulations would be clearly unreasonable, and consequently the regulations themselves, demanding such action, must fall.

"However, our holding with respect to the second sentence of the regulations should in no way be construed as precluding the carrier, in the exercise of the judgment which it is required to make in furnishing or refusing service, from giving the weight or consideration, which it decides is justified under the circumstances, to *any* evidence, including evidence or representations which may be made to it by law enforcement agencies. No rule of thumb can be prescribed for application to the situations in which a carrier must make a decision. It may be observed, however, that the nature of the offense involved, the strength of

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A most important factor in the *actual* cost of a new or expanded exchange cannot be stated in advance; the cost of maintaining the system after the initial cost is funded. When you are considering a North proposal you can be sure that this unknown factor will prove so small that the *actual* cost of providing this improved service for your subscribers will be *the lowest you can get.* As a typical North proposal stated:

". . . The North "All-Relay" system consists of simple stationary structures . . . performing all the multiplicity of switching by the simple rocking motion of relay armatures, free from friction . . . unchanging throughout many years of service . . . renders fast, accurate and reliable service under adverse conditions of traffic, outside plant and weather, with a negligible amount of maintenance attention and expense . . ."

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the evidence of its perpetration, and the patent need for social protection demanding immediate action, may in certain cases prompt the carrier to discontinue service without notice to the subscriber; while in other cases, perhaps instanced by the circumstances under which complainants herein were threatened with loss of their telephone service, the carrier may justifiably feel that notice of the proposed discontinuance can be afforded the subscriber so that he may avail himself of legal remedies looking toward continuance of his service. Manifestly, although the carrier may in some situations offer the subscriber a grace period during which he may seek to prevent interruption of his service, in others immediate action will be indicated. We recognize that these are questions calling for careful judgment on the part of the carrier. But the fact that such an arduous task may be imposed upon the carrier, and that it may possibly be visited with civil or criminal liability in the event of a mistaken decision on its part, cannot constitute a reason for permitting it to immunize itself from all responsibility for discontinuance of service. . . ."

Accordingly, the commission ordered the defendants to file tariff schedules by Feb. 1, 1952, on not less than one day's notice, cancelling the sentence in question.

To that extent, the commission sustained a complaint filed with it by Harry and Bertha B. Katz, of Washington, D. C., directed against the regulations, after they had been notified by Chesapeake & Potomac Telephone Co. that their telephone service would be discontinued in compliance with a request by the United States Attorney for the District of Columbia. The request was later withdrawn.

The above action was taken on Dec. 19, 1951, by Commissioners Hyde, Webster and Jones, with Commissioners Coy and Sterling concurring in the results and issuing a separate statement; Commissioner Walker dissenting, and favoring adoption of the hearing examiner's initial decision to dismiss the complaint; Commissioner Hennock not participating.

V V

Ohio Associated Emergency Increase Plea Overruled

Ohio Public Utilities Commission overruled a motion to hear an application by the Ohio Associated Telephone Co., Marion, for an emergency rate increase on an individual exchange basis. (TELEPHONY, Nov. 17, p. 39.)

Charles Chastang of Columbus, representing Jackson, Wellston, Oak Hill and Hamden, opposing the proposed emergency rate raise, had sought to have the case heard on an individual exchange basis, rather than a company-wide basis.

Michigan Bell Granted Rehearing on Increase Request

Michigan Public Service Commission has granted a rehearing to Michigan Bell Telephone Co. on its application for a 20 million dollar annual rate increase (TELEPHONY, Dec. 1, p. 30).

The new hearings will start on Jan. 7.

The commission said the rehearing would be limited to "facts and circumstances arising after the conclusion" of the original hearing on the petition.

The commission said it granted the rehearing to forestall a court appeal on its recent denial of the increase.

Either the court appeal or the filing of a new application for an increase would take more time and be more expensive than the rehearing, the commission said.

"The commission concluded," the statement said, "that Michigan Bell's contentions might better be considered in the original case with a consequent saving of money to telephone users."

The company petitioned for the rehearing early this month, contending the commission had made "serious errors" in considering the case.

V V

Virginia T&T Asks $150,000 Rate Increase

Virginia Telephone & Telegraph Co., Charlottesville, recently filed for a rate increase with Virginia Corporation Commission.

In asking for an increase that would boost its annual gross earnings by $150,000, company counsel stated that the firm's present net earnings are unreasonably low.

No flat percentage increase in rates was asked, but the firm has submitted a proposed higher rate structure, differing according to exchanges and classes of service.

V V

Indiana Supreme Court Denies Rehearing of Bell Case

Indiana's Supreme Court on Dec. 20 rejected a new attempt by Indiana Public Service Commission to regain jurisdiction of the $10,100,000 rate case of Indiana Bell Telephone Co. (TELEPHONY, Dec. 8, p. 58).

The high state tribunal's five judges ruled unanimously against a petition for a writ of mandate which would have thrown the Bell case out of the Marion County Circuit Court of Judge Lloyd D. Claycombe.

State Attorney General J. Emmett McManamon submitted the petition, but, following a conference of the judges with McManamon and Patrick J. Smith, company attorney, the court announced verbally it had decided to deny the petition.

The attorney general contended that Judge Claycombe was mandated by a 1929 law to dismiss the Bell appeal because the commission last month canceled its rate order to which the company was objecting. Under the commission action, its own hearings on new cost evidence would be scheduled.

Smith argued that such an action, while the appeal still is pending, would "curtail the equity power of the court which comes from the constitution."

Smith further contended that a lack of fair rates for the company amounts to confiscation of its property.

The company's appeal is from a commission rate order issued last May which granted an annual rate increase of $730,000. Last July $5,400,000 in rate increases were allowed by Claycombe on a temporary basis. He now is considering a company request for a total increase of $10,100,000 annually, including the temporary increases.

V V

Secures Loan OK in Nebraska To Rehabilitate Exchange

Nebraska Railway Commission has authorized Russell Brothers, owner of Panhandle Telephone Co., with exchanges at Dix and Bushnell, to make loans to finance the rehabilitating of the Bushnell exchange, with the security being the exchange at Dix.

Brothers bought the Bushnell exchange, formerly part of Hammond Telephone Co., in July for $2,000 (TELEPHONY, Aug. 4, p. 35), and began a program of rehabilitation, including the construction of a new building. The total cost of rehabilitation was listed with the commission at slightly more than $10,000.

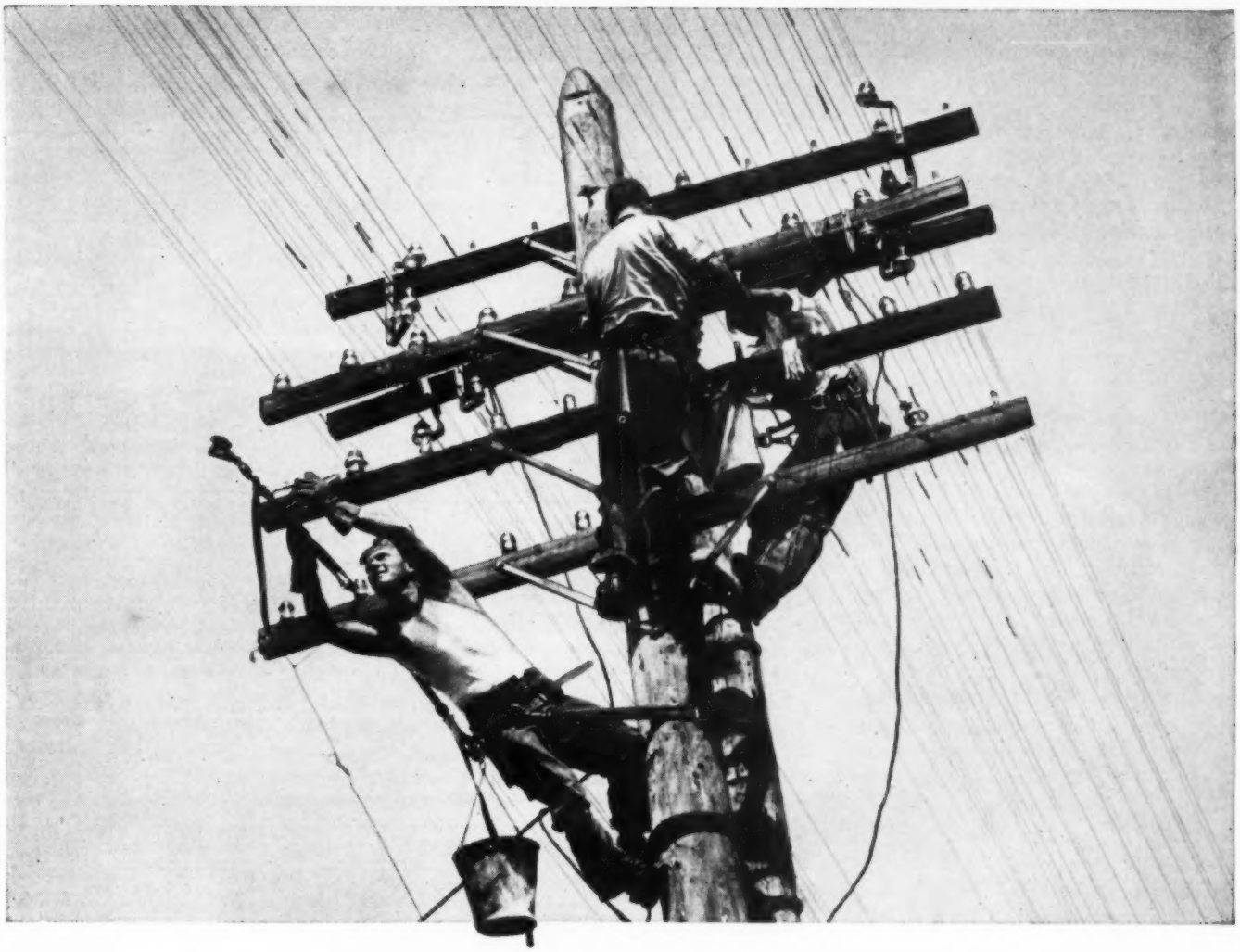
The old property included a magneto plant with grounded lines, while the new system is dial, all lines are metallic, and all telephone sets have been replaced.

V V

Lexington (N. C.) Company Revised Increase to $73,000

Lexington (N. C.) Telephone Co., on Dec. 17 asked North Carolina Utilities Commission for rate increases totaling approximately $73,000 a year, stating that the new revenue is needed to meet rising operating costs (TELEPHONY, Nov. 17, p. 38).

The company serves 4,019 subscribers in Lexington and has not had a rate increase since June, 1949. William C. Harris, president of the company, told the commission that the increase would mean an increase of between $2.00 and $2.50 per month in business rates and



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Hubbard transposition brackets, house brackets, guy clamps, crossarm braces and bolts, lag screws, ground rods — all have been carefully engineered to provide a *plus* safety factor that protects against the extra stress and heavy loads of storms, ice, or sleet. It will pay you to "Hang the load on Hubbard" — via Graybar.

CRAPO WIRE

You'll get additional savings, too, when you use Crapo HTL-85 and HTL-135 high-tensile telephone wires made by Indiana Steel and Wire Co.

Developed specifically for long-span construction, Crapo HTL-85 has a tensile strength 60% greater than that of standard B.B. wire.

Crapo HTL-135 makes spans of up to 450 feet practical under medium loading conditions — permits drastic reduction in the number of pole structures per mile.

And, naturally, your most dependable source for *all* telephone supplies and materials is your local Graybar office.

Located in over 100 principal cities, Graybar offices and warehouses are always conveniently close at hand... are always prepared to furnish helpful assistance.

Graybar Representatives will be glad to help you select suitable telephone supplies, as well as materials and equipment for wiring, ventilating, or lighting your facilities. In addition, qualified Graybar Telephone Specialists are available to help you solve difficult technical problems. So, make it a point to buy where Quality is backed by Service — from your near-by Graybar office. *Graybar Electric Company, Inc., Executive Offices: Graybar Building, New York 17, N. Y.* 182-231

IN OVER
100 PRINCIPAL CITIES

from $1.00 to $1.25 in residential rates. No one appeared at the hearing in opposition to the request.

The company earlier had estimated that the increase it is asking would total between $45,000 and $50,000 a year, but it told the commission at the hearing that this estimate had been revised upward to about $73,000.

In addition to rural plant expansions, the company said it is planning an addition to its headquarters building at Lexington which alone will cost $50,000.

V V

Asks Stock Issue Approval

Randolph Telephone Co., Liberty, N. C., on Dec. 18 asked North Carolina Utilities Commission for permission to issue 150 additional shares of its $100 par value stock, the proceeds from which would be used for improving its system. The company serves approximately 300 customers.

V V

Rate Rise of 41% in Argentina

Communications companies were authorized by the Argentine government on Dec. 20 to increase their rates by 41 per cent, effective Jan. 1. The increase is to offset higher operating costs.

Bay State Rate Hearings Start; $12 Million Goal Set

Massachusetts Department of Public Utilities began hearings on Dec. 17 on the petition of New England Telephone & Telegraph Co. for a 12 million dollar rate increase. The company, citing higher labor costs and taxes as basic reasons for the desired advance, asked the commission's approval on increasing the charge of local paystation calls from five to 10 cents; on raising most residential telephones from 25 to 75 cents per month, and business telephone costs from 50 cents to $2.00 a month (TELEPHONY, Dec. 1, p. 28).

F. A. Cosgrove, vice president, said that another reason for the desired increase is the need to attract capital for a 110 million dollar expansion program planned for the next few years. The company also seeks to impose a temporary surcharge of 2.5 per cent in order to make up for revenue lost during the eight months which would be required to change over the paystations to the 10-cent basis.

The commission has suspended the effective date of the increase to Oct. 29, 1952, in order to provide ample time for consideration of the case. A new feature of the case is the introduction of the prospect of still higher telephone rates because of increased tax assessments on the company by local municipalities. In the wake of a ruling by the state tax appellate board, several cities are planning to raise their tax assessments on wires, poles, machinery and conduits belonging to the New England company, American Telephone & Telegraph Co. and Western Union.

Massachusetts tax commissioner Henry F. Long, whose valuations were lower than the tax appellate board has approved, has appealed to the state supreme court against the latter board's action resulting in a tax increase by the city of Springfield totaling $6,699,730, compared with a former $3,623,050 for New England, AT&T and Western Union companies.

The company pointed out that its new construction program in 1952 alone totals 34 million dollars. Since 1947 the Massachusetts commission has given the company rate increases approximating 20 million dollars.

V V

Nevada Commission Refuses Increase After Rehearing

Controversy over whether Bell Telephone Co. of Nevada will get a $304,000 intrastate rate increase in that state was returned to District Court Judge Clark J. Guild after Nevada Public Service Commission filed an opinion in the county clerk's office at Reno on Dec. 17 reaffirming its order of last June 25 denying the proposed rate boost (TELEPHONY, July 28, p. 34).

The commission contended that the company is receiving a reasonable return on its investment and that present rates are adequate.

When the commission first rejected the company's application, the company took the matter to the first judicial district court. Because new evidence was submitted by the company at the court hearing, the case was immediately referred back to the commission.

As a result of the commission's reaffirmation of its original order, it will now be up to the district judge to make final decision.

V V

North Carolina Company Given More Time to Arrange Financing

North Carolina Utilities Commission on Dec. 17 allowed Old Town Telephone Co., Winston-Salem, an additional six months in which to arrange its plans for borrowing $300,000 from the Rural Electrification Administration (REA) and for issuing 500 shares of $100 par value stock.

Company plans, first approved last April 18, were delayed by unexpected technicalities in the company's negotia-

Longer service all along the line

You can cut maintenance and replacement costs by installing Armstrong's Glass Insulators on your lines. These rugged insulators are thoroughly tested at the factory to insure long, dependable service in the field.

Armstrong's Insulators are hand-gauged for uniform accuracy of thread contour—they fit pins perfectly. They resist thermal shocks far more severe than any encountered in actual use. They will safely support great lengths of line and stand up under loads that can bend standard metal pins. Their smooth, flat seams make them safe to handle—even without work gloves!

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The only question is "when?"

Sooner or later the man looking for a better truck buys an International.

Then he wonders why he didn't do it sooner. He gets better performance, he cuts costs, he makes more money.

If that's what you want, the only question is "when?"—when are you going to see your International Truck Dealer or Branch and get all the facts about the new International Truck that is engineered to do your job better, at lower cost?

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Only Internationals give you—

- All-truck engines designed exclusively for truck work, developed and built in the world's largest exclusive truck engine plant.
- The "roomiest, most comfortable cab on the road"—the Comfo-Vision Cab designed by drivers for drivers.
- Super-steering system—more positive steering control with easier handling and 37° turning circle for greater maneuverability.
- The traditional toughness of trucks which have been first in heavy-duty truck sales for 19 straight years.
- The world's most complete line of trucks . . . 115 basic models, from ½-ton pickups to 90,000 lb. GVW off-highway models.
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International Harvester Builds McCormick Farm Equipment and Farmall Tractors . . . Motor Trucks . . . Industrial Power. . . Refrigerators and Freezers

INTERNATIONAL TRUCKS

More than One Million Now on the Road

Model L-120, 127 inch wheelbase, special utility body, 5,400 pounds GVW.

tions with the REA, the commission said. The problems have been settled, it was added, and the loan soon may be granted.

Old Town serves approximately 720 telephone users in Old Town, Rural Hall, King, Lewisville and Stanleyville, and will use the proceeds from the stock sale and loan for expanding and improving its system.

V V

Gray Elected Vice President Of Northwestern Bell

R. B. Gray, Omaha, has been elected a vice president of Northwestern Bell Telephone Co., E. J. McNeely, president, announced on Dec. 21. In his new capacity, Gray will deal largely with matters related to the company's financial operations.

A native of Des Moines, Iowa, and a graduate of Grinnell College, Gray started working for the company in 1924 as a clerk at Storm Lake, Iowa. In 1929, he was assigned to the firm's commercial office in Des Moines. In 1937, he was named district manager in Mason City. Three years later he assumed the same post in Waterloo, Iowa.

Gray went to Omaha in 1946 and was appointed assistant to the president early in 1948.

Three Promotions Announced By Northwestern Bell

Three appointments to executive positions were announced recently by Northwestern Bell Telephone Co., Omaha, Neb.

C. T. Young was appointed assistant to the president (personnel department), with duties including general policies, training and information; M. L. McLellan, assistant vice president (personnel), in charge of labor relations, and M. P. Brogan, tax commission member. Brogan succeeds M. I. Crossland.

Young has been with the company since 1926, when he was graduated from the University of Iowa. He has been district manager at Des Moines and Minneapolis. McLellan, who began in 1926 as a groundman, has held positions in the plant engineering department, and was chief engineer for the Iowa area. Brogan has been with the company since 1922, was commercial engineer for the Nebraska and South Dakota areas, and more recently was a commercial engineer in the general office.

V V

Five Kentucky Towns File Rate Protest

A brief has been filed before Kentucky State Court of Appeals in protest against rates charged by Kentucky Telephone Corp. over a three-year period (TELEPHONY, Aug. 11, p. 23).

It covers rates the company charged from Nov. 21, 1947, to Dec. 6, 1950, in Lexington, Versailles, Midway, Wilmore, and Nicholasville.

Strother Kiser, special attorney for Midway, filed it in support of an appeal now before the high court.

The rate under protest is the first of two granted the company by Kentucky Public Service Commission since 1947. The second increase is not involved in the suit.

Kiser's brief contends that there were errors in the commission ruling that would require a refund of more than $200,000 to rate-payers.

V V

Two Independents Seek Increases in Georgia

Georgia Public Service Commission has under advisement two petitions for telephone rate increases.

The petitions were submitted by Davisboro Telephone Co., which wants a $1.00 a month increase, and by Farmer's Telephone Co., Springfield, which wants a 25-cent increase.

V V

OBITUARIES

WALTER PEDIGO, 73, prominent Pratt, Kan., businessman, died on Dec. 19 at the Pratt County hospital.

A past president of the Southwest Telephone Co., Pratt, he retired from active participation in company affairs in 1949. He had been closely associated with the Kansas state chamber of commerce since its organization.

He is survived by his mother and two sisters.

* * *

FRED T. CALDWELL, a director of International Telephone & Telegraph

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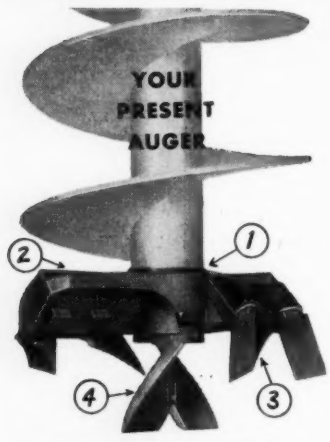

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2. Twin helix design eliminates back thrust; bores true, clean holes in any soil.
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4. Live-action pilot bit won't pivot; penetrates ground you could never bore before!

All wearing parts replaceable on the job, and are interchangeable with the well known heavy duty PENGO Earth Auger parts of the same size.

Available in nine sizes, from 8" to 24" diameter.

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Corp., and associated companies, died on Dec. 21 in Memorial Hospital. His age was 68.

Born in Bloomfield, Iowa, and graduated in 1903 from Iowa State College, Mr. Caldwell worked for Independent telephone companies until 1911, when he went to Canada as general manager of the municipal telephone system at Edmonton, Alberta. In 1915, he was named superintendent of telegraphs and time service for the Grand Trunk Pacific and Canadian Government Railways.

He went overseas as a captain in the Signal Corps of the A.E.F. in the first World War, seeing action at Chateau Thierry, San Mihiel and the Argonne.

In 1920, when I.T.&T. was founded, Mr. Caldwell became chief engineer for one of its original units, the Cuban Telephone Co. Four years later, he was transferred to Spain as chief engineer of the Spanish Telephone Co. in which capacity he had much to do with the modernization and expansion of the telephone system in the Iberian peninsula.

After a period of service from 1931 to 1934 as technical supervisor of all I.T.&T. operating companies in South America, Mr. Caldwell went back to Spain as vice president and technical director of the Spanish Telephone Co.

Just before the outbreak of the Spanish Civil War, he was named executive vice president, and, in 1937, became a vice president of I.T.&T. He was made a director in 1943.

His duties were expanded in 1945 to include the vice presidency and directorship of the International Standard Electric Corp., the subsidiary charged with manufacturing operations, overseas. At the request of the federal government, Mr. Caldwell was assigned to Germany as deputy commander of the communications division of the United States Military Government.

He returned here late that year and took over the presidency of International Standard Electric. Two and a half years later, he was elected president of the Federal Telephone & Radio Corp., I.T.&T.'s largest domestic manufacturing associate. In 1949, he returned to Spain as I.T.&T.'s vice president for the peninsula.

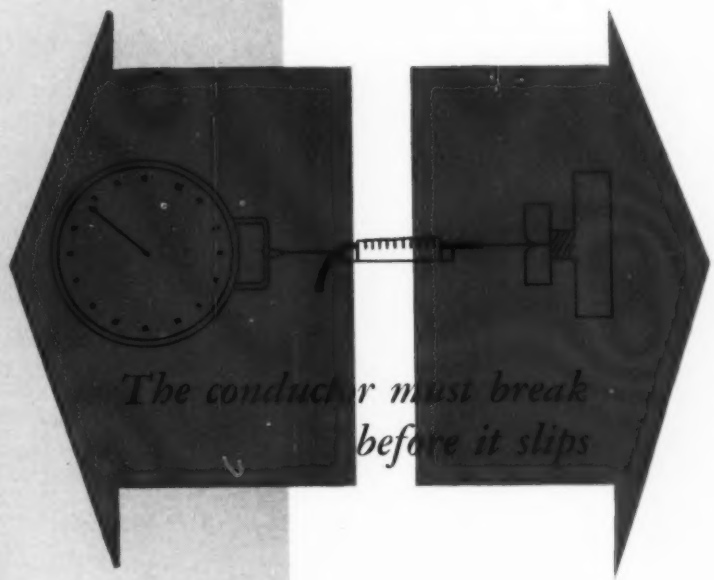
Mr. Caldwell leaves his widow, the former Shirley Osborne.

V V

>> The number of telephones added in the United States during the past decade very nearly equals the entire growth in the previous history of the telephone.

ALPHADUCT

P clamp adhesion test



P clamps are the most widely used method of attaching drop wire to buildings. Lest you may worry about a P clamp causing slipping of the insulation or jacket on Alphaduct Neoprene Jacketed Drop Wire — read about this Alphaduct service test. This test is made daily.

A sample of Alphaduct wire is inserted in a P clamp with 12 inches of the wire projecting from the top of the clamp. The bail of the clamp is then inserted in the upper jaws of a tensile testing machine, and the end of the wire is stripped free of jacket and insulation and inserted in the other end of the machine.

The jaws of the machine are then gradually separated until the conductor breaks. The conductor must break before there is ANY slipping of either the jacket or the insulation.

Don't have any worries about a little old P clamp hurting ALPHADUCT drop wire. Try Alphaduct. It's dated by a color coded thread so you can see for yourself how long it lasts, how much money it saves.

ALPHADUCT WIRE AND CABLE COMPANY • MILLTOWN, NEW JERSEY
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REGIONAL DISTRIBUTORS • PANKEY SUPPLY CO. CHARLOTTESVILLE, VA.
THE LINDSAY TELEPHONE SUPPLY CO., CLEVELAND, OHIO

Transmission Units

(Continued from page 17)

listener any abnormal loss which may be present in the circuit, as the listener's ear is more responsive to small changes in volume, if the overall loss of the talking circuit approaches the limiting value.

This testing arrangement is "as old as the hills" but has genuine merit, and is worthy of adoption in any office. Many offices still do not utilize this simple test. Some of the larger companies have in recent years changed from a 20 db to a 26 db network. This change has been made on the theory that present day high efficiency telephones in offices offer a 5 to 6 db gain as compared to the older sets; hence, the network loss must be increased to offset this gain.

1,000-Cycle Transmission Tests

The measurement of the loss in ac voltage along a telephone circuit or through telephone equipment is for most transmission purposes a good test of the talking efficiency of the circuit. For non-carrier talking circuits, the measurement of the voltage drop in terms of a 1,000-cycle fixed frequency measuring current is standard. A comparison of the measured loss with the theoretical loss to be expected from the facilities involved will readily disclose circuit or equipment defects which are a source of poor transmission.

Tables 1, 2 and *3* give 1,000-cycle loss values per unit length for various cable and open wire facilities.

The small and medium size exchange will require for 1,000-cycle transmission measurements the following equipment:

(1) 1,000-cycle oscillator or inductor alternator.
(2) Direct Reading Decibel meters with a range of 0 to —15 dbm.
(3) Adjustable resistance network for line termination where required.

The ideal transmission measuring meter would be one with a very high impedance and capable of reading accurately levels as low as 20 db. But the majority of the copper-oxide type transmission meters available have impedances of the order of those of the circuits and equipment under measurement; hence, it is usually desirable to arrange the measuring meter so it has an impedance across the measuring circuit of about 600 ohms and serves as the terminating impedance. When

Types of Wire	D-C Resistance (Ohms per Loop Mile)	1000 Cycle Impedance (Ohms)	1000 Cycle Attenuation (db's per Mile)
Side Circuits			
83 Mil Steel (Open)	117.18	2000 / 29°	0.39
109 Mil Steel (Open)	68.20	1425 / 26°	0.313
80 Mil Copper (Open)	17.50	766 / 18°	0.117
104 Mil Copper (Open)	10.30	692 / 12°	0.073
128 Mil Copper (Open)	6.82	649 / 8°	0.052
165 Mil Copper (Open)	4.10	612 / 5°	0.035
104 Mil Copperweld (Open)	24.90	805 / 25°	0.160
128 Mil Copperweld (Open)	16.50	712 / 19°	0.119
165 Mil Copperweld (Open)	9.80	632 / 13°	0.0783
Phantom Circuits			
80 Mil Copper (Open)	8.75	454 / 15°	0.095
104 Mil Copper (Open)	5.15	421 / 9°	0.066
128 Mil Copper (Open)	3.41	400 / 7°	0.049
165 Mil Copper (Open)	2.05	373 / 4°	0.035
104 Mil Copperweld (Open)	12.45	472 / 21°	0.143
128 Mil Copperweld (Open)	8.25	427 / 16°	0.106
165 Mil Copperweld (Open)	4.90	390 / 11°	0.071
Drop Wire			
18 ga. (0.040) Bronze	269.30	440 / 44°	3.69
17 ga. (0.045) Bronze	147.8	335 / 44°	2.64
18 ga. (0.040) Copperweld	229.25	398 / 44°	3.60
17 ga. (0.045) Copperweld	181.84	352 / 44°	3.20
14 ga. (0.064) Copper	26.40	140 / 36°	1.00
22 ga. (0.025) Copper inside wire	174.00	400 / 43°	2.59

Table No. 2—Attenuation and impedance characteristics of open wire and drop wire.

Construction
With the Double
and America's
gould planté ..
the aristocrat of stationary batteries

Many Planté batteries are still in active float service after twenty, thirty, even years! That's because Planté plates heavy, solid sheets of pure lead. In batteries Gould has eliminated the pri cause of self-discharge, capacity losses shortened battery life. Cut maintena charging and replacement costs to a mum. Choose Planté.
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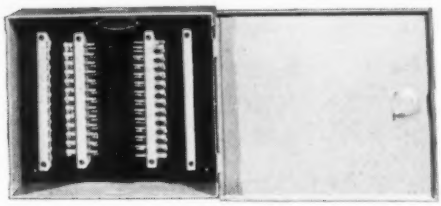
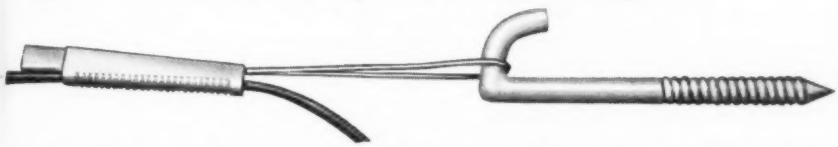


cook type "57" interior terminal box

The type 57 interior terminal box is for distribution and termination of lead-covered or loom cable for low-voltage circuits. The box itself which has an Underwriters' Laboratory listing is constructed of smoothly enameled steel, with hinged cover and necessary knock-outs. Fanning strips and terminal strips are provided as well as screw connectors on the drop sides and solder clips for cable wires.

reliable *drop wire clamps*



***Manufactured by* RELIABLE ELECTRIC COMPANY**

TYPE "P"—for No. 17 parallel reinforced. Holds drop wires at moderate tensions, but concentrates pressure on small area under heavy loads.

TYPE "PS"—for No. 17 and 18. Particularly for smaller, weaker wires. Even under breaking loads the "PS" supports drop without damage.

Reliable Drop Wire Clamps are unique in that they:

1. Prolong life of drop wires by permitting free swinging at the support, placing all wear on the hardware.
2. Permit stringing and sagging of service drops before cutting wire.
3. Automatically tighten under load, assuring a firm grip without damaging insulation.
4. Eliminate sharp bends in wire.

"Reliable identifies the quality"

everstick anchors

. . . are designed to meet the most rigid anchoring and guying specifications.

The patented EVERSTICK Nut Housing locks anchor firmly on rod, making installation simple under all conditions and permitting easy recovery of the rod. Note well-designed, heavily constructed sections of metal in base plate.

EVERSTICK Expanding Plates are *ribbed* to double their original strength; their cutting edge and wedge shape arm socket reduces earth resistance to a minimum and assures easy expansion.

Three-Way EVERSTICK with expanding plates—contacts solid earth at every point around base plate, giving full benefit of earth's holding power.

Spreader Arms extra heavy ribbed with ball and socket joint at top and clinched socket on expanding plates allow heavy bearings to move freely with minimum friction, insuring easy expansion which eliminates buckling or breaking of arms.

EVERSTICK Anchor

. . . the anchor of merit

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so used care should be taken to remove the normal line termination.

Effect of Impedance on Measurement Accuracy

In making transmission measurements we must always keep in mind the effect of line and equipment impedance on the accuracy of our measurements. The effect of impedance on our meter readings can be understood if one will consider how a transmission meter functions.

As previously mentioned, the transmission meter is simply a copper-oxide type voltmeter which shows the level of the power passing into the input to the line under measurement, or the power level received at the output of the line.

Inasmuch as the voltmeter is calibrated in terms of a *fixed impedance and reference power*, it is apparent that readings taken across impedances greater than the calibration impedance will be higher than they should be, and if the impedance is below the calibrating value then the meter readings will be lower than they should be.

The impedance of the most common types of telephone circuits vary from below 400 to above 1,200 ohms. For normal transmission measurements, lines and equipment are considered as having an impedance of 600 ohms. The accuracy resulting from this assumption is sufficient for ordinary transmission work on non-carrier circuits.

For more precise measurements the impedance of lines and equipment should be taken into consideration and, if the impedance of the measured circuits are materially different from the impedance at which the transmission meter is calibrated, then corrective factors, which take this difference into account, should be applied to the readings obtained.

Cable Ga. (A.W.G.)	Type of Loading	Attenuation In Decibels per Mile	IMPEDANCE Magnitude	Angle
28	NL	3.50	....	
26	NL	2.67	1007	/ 44.5°
24	NL	2.14	778	/ 44.2°
24	M-88	1.31	987	/ 23.7°
24	H-88	1.13	1160	/ 14.6°
24	B-88	0.86	1532	/ 8.1°
22	NL	1.79	567	/ 43.8°
22	M-88	0.92	905	/ 13.7°
22	H-88	0.79	1051	/ 9.7°
22	B-88	0.60	1420	/ 5.3°
19	NL	1.26	402	/ 42.8°
19	M-88	0.49	856	/ 9.1°
19	H-88	0.42	1017	/ 5.2°
19	B-88	0.34	1395	/ 2.8°
16	NL	0.76	320	/ 40.6°
16	H-88	0.21	1130	/ 2.8°

Table No. 3—Attenuation and impedance characteristics of cable.

Typical Sources of Measurement Error

For ordinary routine transmission measurements on non-carrier circuits the principal sources of error would be (see *Fig. 4*):

(1) Use of a "load terminating" type meter across a circuit without disconnecting the normal terminating load across the circuit.

(2) Use of a low impedance meter across the input circuit and then disconnecting this meter while the output level is being measured.

(3) Use of a high impedance meter across the output of a circuit without terminating the line in its characteristics impedance.

Transmission Testing Programs

Those Independent companies that have not previously engaged in transmission testing, and that may now wish to do so, could institute a transmission program along any or all of the following lines:

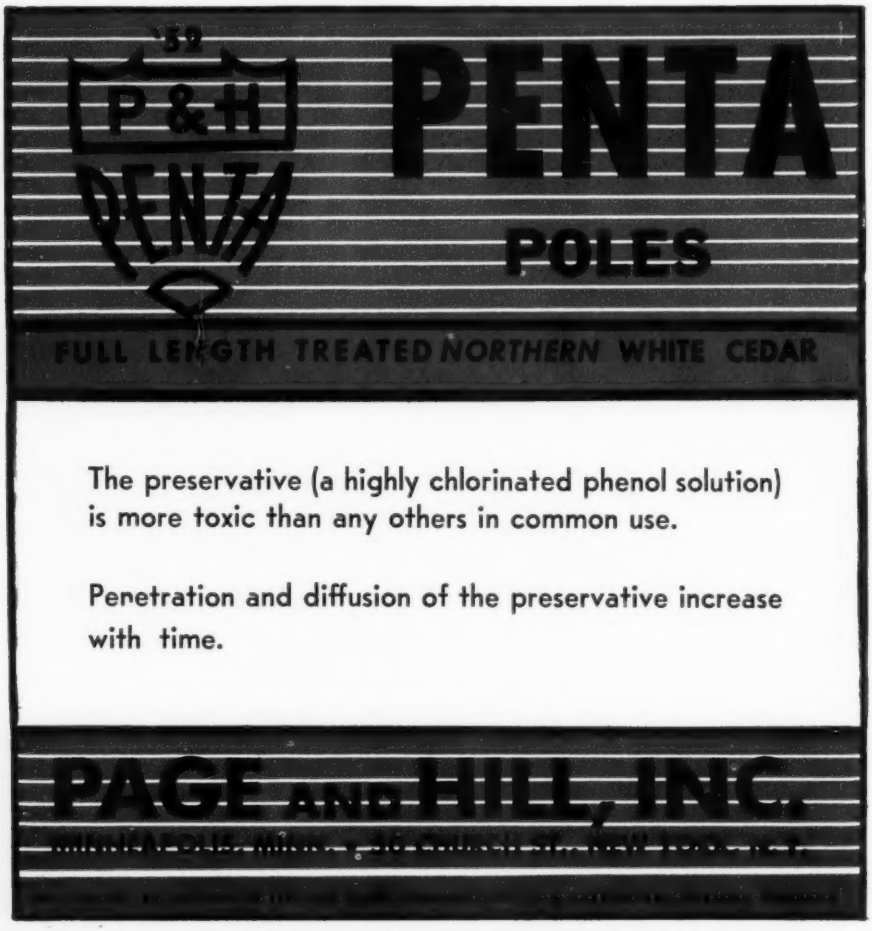
(1) Make transmission tests only in connection with specific complaints of poor transmission.

(2) Make transmission measurements on each new subscriber's loop at time the phone is installed.

(3) Make wholesale transmission rehabilitation checks of all toll lines, C.O. cord circuits, and long rural subscribers lines on those exchanges where this has not previously been done.

(4) Set up a program of routine checking on an annual basis the transmission on toll lines, cord circuits, long rural subscribers lines, etc., in each exchange.

In considering the desirability of incurring the expense of instituting transmission test in any exchange, it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POLES
FULL LENGTH TREATED NORTHERN WHITE CEDAR
The preservative (a highly chlorinated phenol solution) is more toxic than any others in common use.
Penetration and diffusion of the preservative increase with time.
PAGE AND HILL, INC.

should be kept in mind that transmission tests differ from ordinary continuity (i.e., ohmmeter tests) in their ability to detect excessive loss in a circuit. This results from the fact the performance of the circuit or equipment under test is determined at talking frequencies and any factor which would tend to attenuate the subscriber's voice will be picked up in this type of measurement. A direct current ohmmeter test will often fail to detect sources of substantial loss particularly in C.O. equipment and the subscriber's telephone.

V V

Denver-Colorado Springs Cable in Service

The last 36 of an initial group of 48 telephone cricuits were placed in service on Dec. 6 on a buried cable recently completed between Denver and Colorado Springs, Colo., by the Long Lines department of American Telephone & Telegraph Co. When fully equipped the cable will represent an investment of about 3 million dollars.

At Denver, circuits on the new cable can be linked to Long Lines central transcontinental cable route or to telephone channels on the recently completed ccast-to-coast radio-relay system.

The 76-mile cable, under construction since July of this year, ultimately would be capable of providing up to 480 telephone circuits and over 100 telegraph and teletypewriter channels.

Except for short sections of underground circuit at the two terminal cities, the cable was plowed underground to a depth of four feet. Nine "booster" or amplification stations have been built along the cable route.

V V

Cut Over to Dial In Fairfield, Texas

Three States Telephone Co., Corsicana, Tex., cut over to a new Stromberg-Carlson XY dial switching system at Fairfield on Dec. 8, according to an announcement by K. E. Schuler, general manager, Corsicana.

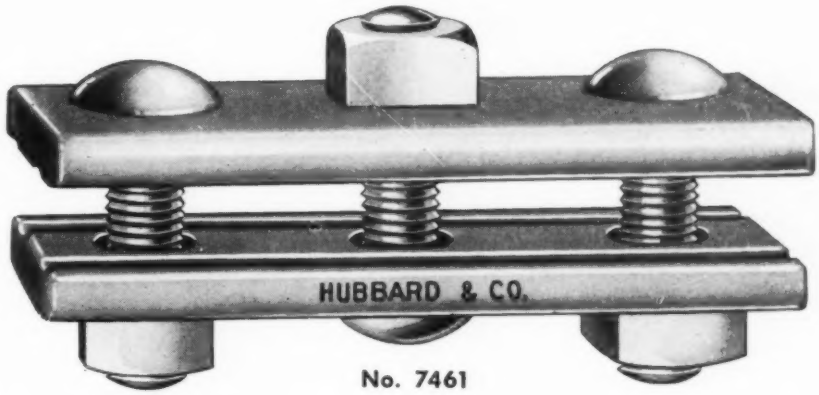
The new system was cut in service with 409 stations on 300 lines. Rates were authorized for the new service ranging from $2.50 to $4.00 per month for residence telephones and from $4.25 to $6.75 for business telephones, depending on the class of service.

The cut-over was attended by a number of company employes who, under the direction of S. C. Lipsey, plant superintendent, helped build the system. Carl Price represented Stromberg-Carlson.

HANG THE LOAD ON HUBBARD HARDWARE

HUBBARD GUY CLAMPS

Hot Galvanized



No. 7461

The tremendous holding power of Hubbard Guy Clamps may be attributed to the straight, parallel grooves which grip the strand securely along the entire length of the clamp. Special strength steel bolts have large heads and oval necks which trap in the clamp body and prevent turning while tightening. Clamp Bolts will not strip nor elongate in normal use.

Manufactured in 1 to 4 bolt styles. For complete information, write or call the Hubbard and Company office nearest to you.

HUBBARD HARDWARE FOR THE TELEPHONE LINE

OVERHEAD

Cable Suspension Material—Wireholders
Pole Seats and Balconies—Clevises
Braces—Drive Hooks—Messenger Dead Ends—Extension Arms—Long Span Material—Pins—Clamps—Guards—Stubbing Bands—Guy Protectors—Guy Clamps
Pole Struts—Clips—Straps—Hangers
Carriage Bolts—Rings—Transposition Brackets—Eye Bolts—Pole, Corner and House Brackets—Guy Hooks—Strain Plates—Storm Guy Straps—Lags—Machine and Hubeye Bolts—Sidewalk Guys
REA Telephone Hardware

UNDERGROUND

Cable Racks—Manhole Ladders and Steps
Pulling-in Irons—Expanding Anchors
Cable Shields—Screw Steelwing Anchors
Anchor Rods—Ground Rods and Clamps

HUBBARD AND COMPANY

ESTABLISHED 1843

PITTSBURGH • CHICAGO • OAKLAND, CALIFORNIA

"Hang the Load on Hubbard Hardware!"

In the Nation's Capital

(Concluded from page 14)

out the Freeport (Minn.) Telephone Co. On Nov. 30 a telephone subscriber of the Freeport company wrote to the Minnesota Railroad & Warehouse Commission as follows:

"We understand that the local telephone company is going to be sold to an REA telephone company.

"We have had the impression that, in order to continue to receive telephone service, we will have to buy stock in the REA, or else our telephone will be taken away.

"Can you please tell us whether we can keep our telephone service if we pay the rates, if we do not buy stock?"

Yours very truly,
/s/ Herman Weidner

Last month, the following report was received by this telephone subscriber from O. A. Ossanna, secretary of the commission in St. Paul.

"Reference is made to your letter of Nov. 30, concerning a request of the Albany Mutual Telephone Association that you become a stockholder in the Association in order to secure telephone service.

"Under the Minnesota statutes this company is a public utility and, as such, must render service to any applicants in the territory in which it operates. It cannot require you to become a stockholder as a prerequisite to receiving service."

While all of the regulatory statutes governing telephone companies are not the same, most of them provide for state commission approval before the telephone utility property can be sold. And most commissions are quite likely to act the same as the Minnesota commission has indicated. Membership in a cooperative or any other association cannot as a general rule, be required in order to receive telephone service, or a continuation of telephone service, from a telephone company.

If higher rates are necessary, as a result of an improved brand of service, the commission will investigate and allow reasonable increases. But membership itself, and membership fees, have nothing to do with service from a public utility once dedicated (and, therefore, obligated) to serve the public. This is a good thing for small companies to keep in mind in forthcoming discussions about the sale and acquisition of telephone property under a consolidated cooperative. Volunteer membership, of course, is always in order. But that is not the same as a required financial contribution as the price of staying on the line.

The second four-diamond 45-year service emblem awarded by Associated Telephone Co., Ltd., Santa Monica, Cal., was presented recently to ORRIN GALLUP (left), central district manager, by EDWIN M. BLAKESLEE, president. Gallup was 15 years old when in 1903 he became a night operator for Sunset Telephone & Telegraph Co., Pomona, Cal., while still attending school. Wages in those days totaled $20.00 per month for seven nights a week from 9 p.m. to 7 a.m., with a night off every two weeks. Gallup worked for the old Whittier (Cal.) Telephone & Telegraph Co. and the Downey (Cal.) Home Telephone & Telegraph Co. He became vice president and general manager when the two companies were merged into Consolidated Telephone Co. He held that job until 1948 when Associated Telephone Co., Ltd., purchased the Consolidated company. He was then appointed manager of Associated's central district.

Do those plowed field jobs this winter when the ground is frozen!

Bore through FROZEN Ground WITH A PENGO Auger

- ★ *Avoid crop damage*
- ★ *No getting stuck in the mud*
- ★ *Improve public relations*

DO a faster, *better* job with a scientifically-designed PENGO Auger—the twin-helix auger that bores clean, true holes in any kind of soil, most sandstones, hardpan, decomposed rock, frozen ground—and even in permafrost. Saves power, cuts maintenance to a minimum! 15 sizes; to fit any earth boring machine.

★ **ORDER NOW** *or write today for data and prices*

PETERSEN ENGINEERING CO.
MANUFACTURERS
SANTA CLARA, CALIFORNIA

Fire Losses in U. S. Increase 9.9% Over October

Estimated fire losses in the United States during November were $60,064,000, it was announced recently by Lewis A. Vincent, general manager of the National Board of Fire Underwriters.

This is an increase of 7.7 per cent over losses of $55,790,000 reported for November, 1950, and an increase of 9.9 per cent over losses of $54,660,000 for October, 1951.

Losses for the first 11 months of 1951 now total $663,199,000, an increase of 6.7 per cent over the first 11 months of 1950 which totaled $621,640,000.

These estimated losses under fire insurance policies include an allowance for uninsured and unreported losses.

» Radio trains with broadcasting apparatus, loud-speakers and a master of ceremonies are run on Irish railways which provide a commentary on the famous places en route.

Quiet Telephoning

in noisy locations

You can clearly hear the other party in the hushed interior of a Burgess-Manning Acousti-Booth. A heavy blanket of sound-absorbent material lining the walls traps the noise. Conversations are understandable. Doorless construction. Clean, airy interior. Modern appearance. Floor and wall models. Suitable to any location.

Mail Coupon for Free Booklet

Burgess-Manning Company
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Chicago 31, Illinois

Please send me your booklet describing Burgess-Manning Acousti-Booths.

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Street _____ City _____ State _____

"OFF-JOB TRAINING"

by HARRY C. WALKER, Ph.D.

Training Today Means Production Tomorrow

A New book for your job instructors.

Management, as well as each Department Head, Supervisor, Foreman, or Trainee realizes today the importance of proper and efficient job training.

- With a quarter century of practice and experience in job training, Dr. Walker treats the teacher and learner fully.
- Written in straightforward English, there is an abundance of practical suggestions for lesson planning, classroom procedures, training aids, and many worthwhile topics.
- Price $1.75 each including delivery.

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CHICAGO 5, ILLINOIS

1952 Is called a Year that's new!

Telephone Companies are finding it harder and harder to add to their systems — by the installation of Equipment and Outside Plant.

It costs less to have work done by contract than to do it with your own forces —

We have engineered and constructed many millions of Dollars of Telephone Plant —

Your inquiry should be addressed to

GUSTAV HIRSCH ORGANIZATION, INC.

1347 West Fifth Avenue
Columbus (12), Ohio
or call
L.D. 78 — Kingswood 0611

Utica Drop Forge & Tool Announces Scholarship Program

As a practical means of encouraging young men to secure training to prepare themselves for industrial careers, 10 annual scholarships have been offered by Utica Drop Forge & Tool Corp.

The scholarships, covering residence and subsistence at the State University of New York, provide for two school years of training in the university's Department of Mechanical Technology, which is part of the New York State Institute of Applied Arts and Sciences. In addition, each student is expected to work in a manufacturing plant during the summer months to supplement studies by on-the-job training.

In order to be eligible for the Utica scholarship, young men must have completed high school successfully. Selection is on a competitive basis, as it is hoped the graduates will be individuals who can enter industry in jobs of considerable responsibility.

Awards of the 10 scholarships to outstanding students at the university have already been made for the current school year. In addition, two similar awards have been made to employes of Utica Drop Forge & Tool Corp.

V V

Gould Offers Articles On New Battery Alloy

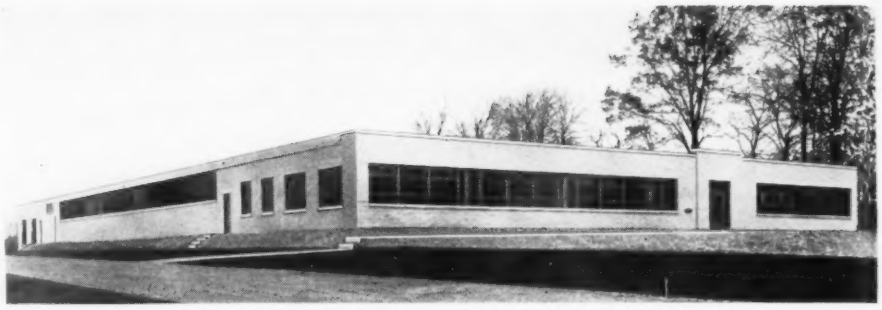
Gould-National Batteries, Inc., Trenton, N. J., is offering a four-page reprint of an article on the new battery-plate alloy, lead-calcium. Batteries comprising this new plate are now being produced for telephone, power plant, and alarm system applications. The article, "Lead-Calcium for Storage Batteries," was written by U. B. Thomas Jr., member of the technical staff of Bell Telephone Laboratories.

Including four graphs giving laboratory test data, the write-up reports on the experiments leading to the development of lead-calcium for battery-plate grids. The grid is the plate framework onto which is impressed paste forms of lead peroxide (positive plate) or lead (negative plate). (The lead peroxide of the positive plate and the lead of the negative plate react chemically with the sulphuric acid of the electrolyte, and electrified particles are set in motion, resulting in an electric current.) The use of lead-calcium results in stronger grids, reduces the rate of battery self-discharge, and decreases the current required to keep stationary batteries fully charged.

The article describes self-discharge in batteries with the older lead-antimony grids and shows why it is reduced 80 per cent by using lead-calcium grids. It relates how stibine (antimony hydride) was discovered in the air of a telephone battery-room and tells how this discovery revealed information on the electrochemistry of storage batteries. The article also describes the procedures followed in analyzing industrial atmospheres and in measuring battery self-discharge. It gives details on the mechanical properties of lead-calcium and explains why grids of this alloy are not weakened in use, as are those of lead-antimony.

One of the four graphs shows the variation in the concentration of stibine gas given off as lead-antimony batteries are charged; another indicates the variation of tensile strength of lead-calcium with percentage of calcium. The other two graphs present data demonstrating the self-discharging tendency of lead-alloy batteries. Data on experimental lead-calcium grids and batteries constructed by Bell Telephone Laboratories are also given.

A reprint of an article on "An Improved Telephone Battery," reprinted from the Bell Laboratories *Record*, also can be secured. Another article on "The Lead-Calcium Telephone Storage Battery," by Ray Blain, member of United States Independent Telephone Association plant committee and TELEPHONY's technical editor, also is available. Requests for these articles should be addressed to Leslie Broomfield, Gould-National Batteries, Inc., Trenton 7, N. J.



Schauer Manufacturing Corp., manufacturers of Electrox rectifiers for the telephone and telegraph industry, as well as electrical radio and automotive equipment, has moved its offices and production facilities into the new, modern plant shown above at 4500 Alpine Avenue in Rossmoyne, a suburb of Cincinnati, O.

Work of the U. S. Signal Corps in Korea is done by men like PFC. LEE R. PARKER (left) of Flint, Mich., who holds a field set while SGT. ARTHUR J. MOPAVICH (right) of Saginaw, Mich., squad leader, calls the wire chief to check the position of trouble in the telephone line.

Highway Trailer Opens Sales, Service Branch in Cincinnati

Opening of a direct sales and service factory branch in Cincinnati was announced recently by H. L. Charlton, president of Highway Trailer Co.,

L. E. CRAIG JR.

Edgerton, Wis. The new factory branch will be located at 2150 Colerain Ave. It will be under the supervision of L. E. Craig Jr., as manager.

The new branch is established not only for the sale of Highway's trailers, tanks, and utility equipment, but also for the repair and maintenance of utility equipment and any make of trailer or tank, the company says. A parts department will carry a full line of repair and replacement parts. The company plans to open the new branch about Jan. 1.

The Highway Cincinnati branch will include more than 16,000 square feet of shop space in addition to the parts department, offices and a storage lot.

V V

Kellogg Advertising Plan To Include Sale of Americanism

Kellogg Switchboard & Supply Co., Chicago, Ill., has announced a plan to devote a portion of its 1952 advertising budget to the selling of Americanism.

The first ad of this series appeared in the November 3 issue of TELEPHONY. The second ad of the series appears in this issue.

V V

Iowa Town Praises Company For Cut-Over to Dial

Evidence of the real results of good public relations in the telephone industry was reported recently in the Lime Springs (Iowa) *Herald*.

The newspaper on Dec. 6 devoted a four-page section to news and advertising featuring Lime Springs Telephone Co.'s cut-over to dial, giving a history of the company, describing the new equipment and paying tribute to the progressiveness of the company, owned by C. C. Pearce of Riceville. The special newspaper section is titled "The Talk of the Community."

One full page ad by the business and professional firms of Lime Springs congratulates Pearce. It says in part: "We take extreme pride in the fact that through your efforts Lime Springs now has one of the most modern dial telephone systems in this section. It is not every town the size of Lime Springs that has a system to compare with the one you have made available to residents of this community."

More than 400 telephones are now connected to the new system, but present facilities will be able to handle 1,000 stations.

V V

Graybar Promotes Two In Credit Manager Posts

Effective Dec. 15, F. R. Warburton has been appointed district credit manager at Chicago for Graybar Electric Co., according to A. H. Nicoll, company president. Warburton replaces F. E. Gibson, who recently was elected treasurer.

C. C. Bradbury has been appointed district credit manager at Minneapolis, replacing Warburton.

ALL the strength and durability inherent in steel are combined—with definite economies— in *Crapo* Galvanized Steel Strand. Heavy, ductile, tightly-bonded zinc coatings, applied by the famous *Crapo* Galvanizing Process, provide lasting protection against corrosion.

Ask the distributor of *Crapo* Galvanized Products near you or write direct for further information!

INDIANA STEEL & WIRE CO.
MUNCIE, INDIANA

TECHNICAL WRITERS

Well-established Chicago manufacturer of telephone equipment has several attractive openings for men having the ability to write clear and well-organized technical descriptions and operating and maintenance manuals. Preference will be given to those having some experience in the field of telephone switching, but consideration will also be given to non-telephone people who are experienced in the writing and production of technical manuals in other fields. Write, giving full details of personal history and experience, and salary expected.

Write Box No. 3132, c/o TELEPHONY.

Lamb Named Vice President Of Weston Corporation

Anthony H. Lamb recently was appointed vice president in charge of manufacturing for Weston Electrical Instrument Corp., Newark, N. J.

Lamb, who started with the Weston company in 1924 as an instrument assembler, became a vice president in 1950 in charge of the company's Tagliabue instruments division. He is a pioneer in the field of photoelectricity and holds an award from the United States Navy for developing special instruments for the Armed Forces. He

A. H. LAMB

succeeds Reginald R. Lambe who has retired after 35 years of service.

Other appointments include that of George T. Deaney to the position of general superintendent of manufacturing and Raymond T. Pierce to chief production superintendent. Deaney was former purchasing agent and defense activities co-ordinator; Pierce was formerly a sales division manager.

V V

Ansonia Electrical Offers Three Booklets on Cables

Ansonia (Conn.) Electrical Co. has prepared three new brochures on fire alarm cables and railroad communication cables. The brochures cover the latest technical advances and give specifications of cables in these fields.

The latest aerial, duct and direct burial cables offer industry the advantages of lower maintenance costs, less installed cost, lighter weight cables, better transmission characteristics, extremely long life and complete waterproofness, according to the brochures.

Long Lines Completes New Cable Project

Completion of a new underground cable from Sikeston, Mo., to Paducah, Ky., was announced on Dec. 17 by the Long Lines Department of American Telephone & Telegraph Co.

Shortly before, the first circuits were cut into service on the new route which ultimately will be able to handle over 400 simultaneous telephone conversations.

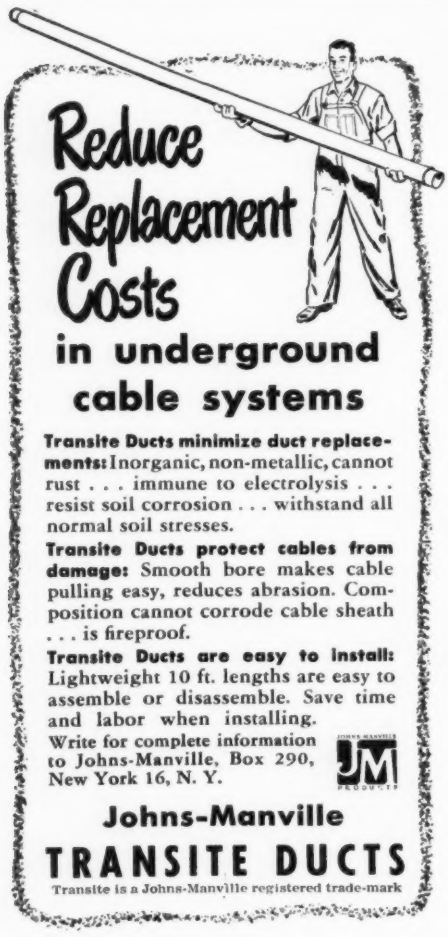
The project, started in July of this year, and representing an investment of over 1 million dollars, was rushed to completion to provide a storm-proof communications route serving the important and rapidly growing Paducah area.

Starting at Sikeston, where it ties in with a major north-south coaxial cable, the new cable, buried to a depth of several feet, runs east to Charleston, Mo., where a repeater station gives the voice currents added energy. From there it goes to a point just below the juncture of the Mississippi and Ohio Rivers where it is placed underwater in a special submarine cable across the bottom of the Mississippi to the Kentucky shore. Passing through other repeater stations at Wickliffe and Gage, Ky., the cable terminates at the telephone company building at Paducah.

The project marks another step toward completion of a 250 million dollar Long Lines construction program, designed to supplement the nationwide network of long distance telephone facilities and provide additional circuits to meet the growing needs of the country's telephone users.

V V

>> India bans strikes from such essential services as postal, telegraph and telephone communications under new laws.


Reduce Replacement Costs
in underground cable systems
Transite Ducts minimize duct replacements: Inorganic, non-metallic, cannot rust . . . immune to electrolysis . . . resist soil corrosion . . . withstand all normal soil stresses.
Transite Ducts protect cables from damage: Smooth bore makes cable pulling easy, reduces abrasion. Composition cannot corrode cable sheath . . . is fireproof.
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TRANSITE DUCTS
Transite is a Johns-Manville registered trade-mark

Federal PABX SYSTEMS...for top performance and increased revenues
FEDERAL TELEPHONE AND RADIO CORPORATION
An IT&T Associate
Clifton, N. J.

SAMUEL W. GIBB has been appointed vice president in charge of sales by C&D Batteries, Inc., Conshohocken, Pa. He will direct the sales of C&D's line of heavy duty storage batteries for the industrial truck communications and transportation fields.

Saves Three on Party Line Trace in Nebraska

A Nebraska teacher and her two small children owe their lives to the alertness and initiative of Ada Davis, operator at the Gering exchange of Platte Valley Telephone Corp., Scottsbluff.

Two faint calls for help came over a party rural line, without identification as to which of the group of subscribers was the one who gave the signal. The operator hurriedly attempted to isolate the call, and, when she got within four or five miles of the location, she called the sheriff.

The sheriff stopped at three or four houses along the dark country roads, and finally found the one from which the call for help had come. The three victims were taken to a hospital for treatment. Fumes from a defective oil stove caused the near tragedy.

V V

Church to Honor St. Gabriel

The first Roman Catholic Church built in honor of St. Gabriel since Pope Pius XII declared him the patron saint of communications was consecrated in Lisbon, Portugal, on Dec. 16 by Archbishop Emanuele Mendes da Conceicao Santos of Evora.

V V

>> Telephones and people in the U.S. have been running neck-and-neck for the past 10 years. Census figures show the population increased about 20 million in the period ending Dec. 31, 1950, while the number of telephones in service went up about 21 million.

SUPPLIES

BULLDOG BRAND TAPE

	1-9	10-95	96 or more
#8 ¾" ½ lb. roll friction tape	.45	.43	.39
#8 ¾" ½ lb. roll rubber tape	.53	.50	.48

CHANCE EXPANDING ANCHORS

100 lbs. FOB Destination

	Eastern	Western
#64 4 way, 6 inch, ea.	2.15	2.42
#6870 8 way, 8 inch, ea.	1.70	1.96
#88135 8 way, 8 inch, ea.	2.90	3.33

In Stock for Immediate Delivery

CROSSARMS, GALVANIZED STEEL STRAND, CROSSARM BRACES, ANCHOR RODS, GROUND RODS, LOCUST PINS, OAK BRACKETS AND MOST OTHER CONSTRUCTION REQUIREMENTS.

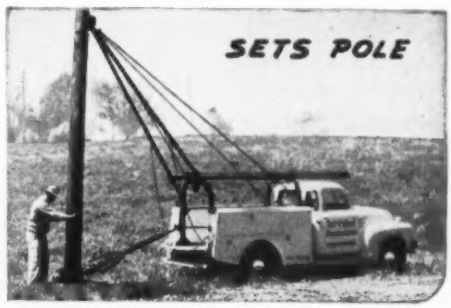
Amertel 12-85 HTL Galvanized Line Wire

Catalog and prices available upon request

Telephone Repair & Supply Company

DANIEL H. McNULTY, Pres. & Mgr.

1760 Lunt Avenue — CHICAGO 26, ILLINOIS



New "325" Attachment . . . Derrick and Digger Unit

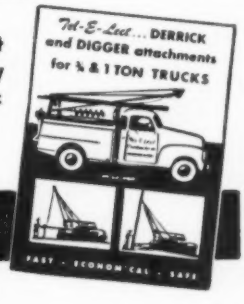
For ¾ and 1-TON TRUCKS

Now your regular telephone service truck can be put to the added use of pole setting. Normally it will take two men less than ten minutes to set up the derrick, attach the digger, dig the hole and set the pole—all ready for tamping. It's all accomplished with the Model 325 Derrick and Digger Attachment, made to fit all service trucks as illustrated.

★ **Answers the need for a two man construction crew**

★ **Sets poles up to 35'; takes augers 8" to 20" diameter**

★ **Packaged unit for installation by your local mechanic**



Write for fully illustrated Bulletin 325.

TEL-E-LECT PRODUCTS, INC.

10007 MINNETONKA BLVD. • MINNEAPOLIS 16, MINN.

CLASSIFIED SECTION

Rates 15 cents per word payable in advance. Minimum charge $3.00 for 20 words or less.

HELP WANTED

MANAGER for rapidly expanding, extensive group of Western telephone properties. Must have administrative ability simultaneously to obtain efficient operations and achieve required sound expansion program, also capacity to hire, train and direct personnel in all phases of telephone work. Permanent position carrying substantial opportunity for qualified person. Technical, plant and commercial knowledge and experience absolute requirement. Salary commensurate with qualifications. Replies confidential. Furnish complete details of education, experience and objectives in first reply. Write Box No. 3122, c/o TELEPHONY.

POSITIONS OPEN FOR MEN WITH PRACTICAL TELEPHONE EXPERIENCE under classification of Lineman, Combinationman and Construction Crew Foreman. Steady employment with good working conditions, and salary commensurate with experience. When applying give age and qualifications. Write Nebraska Continental Telephone Co., Columbus, Neb.

LINEMEN AND APPRENTICES. Good pay. Permanent. Good future with new organization. Write for application blank and full details to Box 247, Station F, Buffalo 12, N. Y.

EXPERIENCED COMBINATION MAN—good habits and industrious, for a company of 850 stations, group insurance, paid vacations and holidays. Write Box No. 3133, c/o TELEPHONY.

HELP WANTED

WANTED AT ONCE — STATION INSTALLERS AND LINEMEN. Must be experienced. Best of working conditions. Write or telephone Wilton Electric & Telephone Cont. Co., Wilton Junction, Iowa. Telephone 21.

EXPERIENCED STATION INSTALLERS, LINEMEN AND CABLE SPLICERS. Write NEALE CONSTRUCTION CO., TOPEKA, KANSAS.

WANTED TO BUY

A 64 year old, reliable, medium sized manufacturing company, over 50 years in the telephone field, wants to acquire devices or companies to broaden its present line.

Write:
BOX No. 3129, c/o TELEPHONY

Old, established, nationally known company interested in the purchase of Patents, New Products or Companies that have an application in the telephone field.

CONTACT
BOX NO. 3013, c/o TELEPHONY

FOR SALE

130-STATION MAGNETO EXCHANGE county seat town southwest Missouri, tourist and farming territory. Must sell at once. Inquire in person and make offer. Mrs. L. A. Neal, Galena, Mo. Telephone 100.

AVAILABLE FOR IMMEDIATE DELIVERY

Stromberg-Carlson 15 position C. B. switchboard consisting of 6 toll positions with universal cord circuits, 8 positions C. B. Super Service 4 party harmonic ringing.

1500	C. B. Lines
50	R. D. Toll Lines
70	Rural Lines
3800 Pr.	Cook M.D.F.
2	Harmonic Converter Sets
2	Interrupters
1	Power Panel
1	50A Diverter Pole M.G. Set
1	50A Mercury Arc Rectifier
1	672 A.H., 11 Cell Storage Battery
1	Test Desk

OSWEGO COUNTY IND. TELEPHONE CO.
FULTON, NEW YORK

POLES

B. J. Carney & Co., 100 N. 7th St., Minneapolis, Minn.—Western red cedar poles. Pentrex Butt Treated or Plain.

Cascade Pole Co., P.O. Box 743, Tacoma, Wash. — Creosoted Douglas Fir and Cedar Poles.

C. M. Christiansen Co., Phelps, Wis.—Northern White Cedar Poles, plain or butt treated.

Dierks Lumber & Coal Company, Creosoting Division, 700 Dierks Bldg., Kansas City, Mo. — Pressure creosoted yellow pine poles at our modern plant at Process City, Ark., near DeQueen.

Eppinger & Russell Co., 80—8th Avenue, New York 11, N. Y.—Creosoted Poles and Cross Arms. Plants: Jacksonville, Fla., Norfolk, Va., Eddington, Pa.

International Creosoting and Construction Co., Galveston, Texas.—Creosoted Southern Yellow Pine Poles. Plants Beaumont and Texarkana, Texas.

Montana Pole & Treating Plant, Butte, Montana — Fir, Lodgepole Pine Poles. Butt-treated or Full-length treated with Creosote or Penta.

T. M. Partridge Lumber Co., Minneapolis, Minn.—Northern White—Western Red Cedar Poles, Plain or butt-treated.

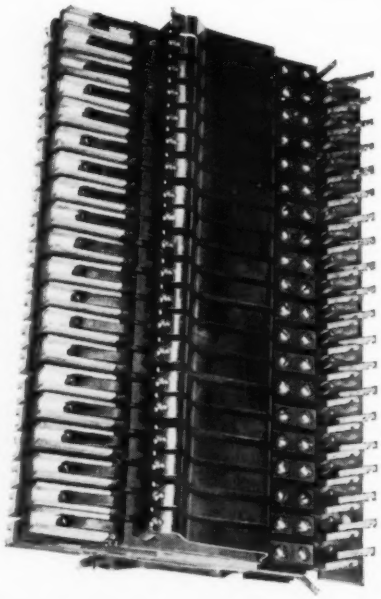
RECONDITIONED

WESTERN ELECTRIC CENTRAL OFFICE PROTECTION

#1269-A (20 pairs per strip)
#1268-A (20 pairs per strip)
#1268-B (23 pairs per strip)

Complete with #26 & #27 protector blocks, and #76-A Heat Coils.

Prompt Shipment



BUCKEYE TELEPHONE & SUPPLY CO.
1250 Kinnear Road **Columbus 8, Ohio**

FOR SALE

SWITCHBOARD PARTS

W.E. No. 22C Drops, individual (new) . $3.00
W.E. No. 2C Red Eye drops and jacks 5 per strip—used $15.00
W.E. No. 30C Shutter, ring off drops 5 per strip—used $10.00
Kellogg No. 503 Shutter drops and jacks 10 per strip—used $30.00
Leich Elec. restoring drops— 10 per strip $20.00
Leich jacks for above drops— 20 per strip $5.00
W.E. No. 1268A and 1269A main frame protectors with heat coils and carbons, reconditioned $17.50
W.E. terminal block binding posts No. 93, No. 65, No. 36, No. 35 . . . . . $3.75

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GERMANTOWN, NEW YORK

SERVICES AVAILABLE

INSPECTION SERVICE

Of poles, crossarms, and preservative treatments. Analyses of wood preservatives. Inspectors stationed throughout U.S.A.

A. W. WILLIAMS INSPECTION CO.
MOBILE, ALA.

Installation Specialists
CENTRAL OFFICES
INSTALLED—MODIFIED—ENLARGED
COMMUNI-CATERING
P.O. BOX 6712 CHICAGO 7, ILL.

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Quality Workmanship at Low Cost
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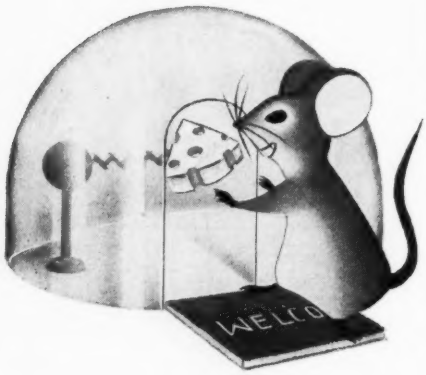

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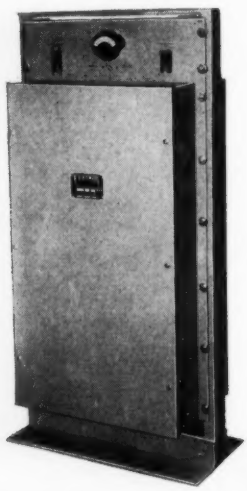

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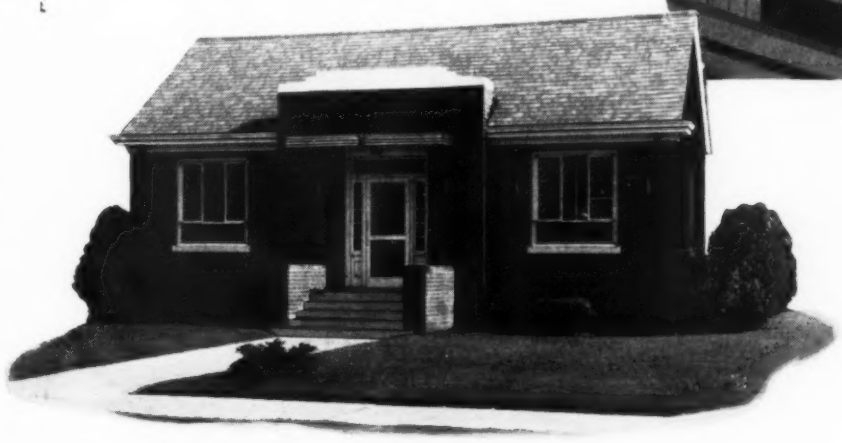

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